App. F. IX-4

Previous References
Rc 137-29 (1-5)

1929-30
(Rc)

File No. 137-29
Serial Nos. 6-8

Later References
L R 142-XCI-5)

PRESERVED

General and Revenue Secretariat.

Serial Nos. Three

7

10

Part B for April 30.

SUBJECT

Acquisition of lands in the Village of Badnawal Kalan Manjanpur Taluk for the Badnawal Spinning Co. Ltd.

D 11510-11 & 14.4.30.

— Dy. Comm. Khaira
Dis. Rc

Sanction Re ———

Rubbing

No. L.A.194/28-29
L.A.15/29-30
Encl one file.

Office of the Deputy Commissioner,
Mysore District.

Dated Mysore, 22nd March *1930.*

From

K. V. ANANTARAMAN, Esq., B.A.,
Deputy Commissioner,
Mysore District.

GEN. 8209 25 MAR
DEVELOPMENT BRANCH

To

H. Rama Rao, Esq., B.A., B.L.,
Secretary to the Government of
His Highness the Maharaja of Mysore,
(Development Department) *Bangalore.*

Dc.137-29-6

Sir,

In forwarding herewith final declaration statements in duplicate in English and Kannada in respect of the acquisition of lands in the village of Badanaval, Nanjangud taluk required for Badanaval Hand Spinning Centre -/ I have the honour to state that the preliminary notifications for the acquisition of the lands in question were published in the Mysore Gazette dated 5-12-29 and objections, if any, against the acquisition of the said lands were also called for as required under Sections 4 and 5(a) of the amended Land Acquisition Regulation 28th day of Dec.1929 was fixed for the hearing of objections. The above facts were widely published in the village by beat of tom-tom and spare copies of the printed notifications were distributed among the concerned landholders.

2. The Sub Division officer, Nanjangud who was authorised to hold preliminary enquiry in this case reports that no objections have been received.

3. In these circumstances, I request that you will be so good as to accord sanction for the publication in the Gazette of the declaration statements submitted herewith and to authorise the Sub Division officer, Nanjangud Sub Division, to perform the functions of a Deputy Commissioner under the Land Acquisition Regulation and take order for the acquisition of the lands in question.

4. Ten spare copies of the Kannada Notification may kindly be arranged to be supplied to the Sub Division officer direct from

5. Connected vernacular records are herein enclosed for favour of perusal and kind return.

I have the honour to be,
Sir
Your most obedient servantm

For Deputy Commissioner,
Mysore District.
(absent from Head Quarters.)

Ce.

HGS Subj. with Dft. &c. the acquisition

29.3.30.

As in this case the question of giving other lands in exchange in commutation may arise, we do not deem necessary to mention about the cost of acquisition.

Dft for appl.

Engg 9/4.

Issue

10 4 30

Engg 10/4

To Mr. Dist. Dr.
Mysore
No. 11510-1 & Ec. 30
Intimating the acqn. of lands in Bastavaal village
To the Compiler Dr.
No D 11512 & 14-4-30
Furnishing the declaration &c in Engg. Dept

18/

1 APR 1930

DISTRICT BRANCH

RTD 3

DRAFT

SUBJECT

Section. Jrs.

File No. 137-29

Serial No.

Diary No. of letter replied to

Proceedings of the Government of His Highness the Maharaja of Mysore.

GENERAL AND REVENUE SECRETARIAT

( )

the *19*

Date of issue 14/4/30

Signed by for S.V. 4.

Read:-

Letter No. B-1904/28-29 dated 22/24.3.30
4 L.A 15/29-30
from the D.C. Mysore
recommending sanction to the acquisition of property (Viz. 4 acres 8 guntas in S.No. 11) in the Badamvadi village of Nanjangud Taluk for
the Badamvadi Hand-
Spinning Centre

ORDER NO. D 11576-11 DATED 14/4/30

The acquisition of the property recommended above is sanctioned, The S.D.O, Nanjangud Sub-Div., being appointed to perform the functions of a Deputy Commissioner under the Land Acquisition Regulation and authorised to take order for the acquisition of the said property.

2. The declaration statements in English and Kannada will be forwarded to the Compiler, Mysore Gazette for publication.

3. The cost of acquisition

~~exclusive~~/inclusive ~~of the statutory allowance~~ may as proposed / be met from ~~the provision~~ the grant of Rs 3,000/- for Initial Expenditure ~~made under~~ on Badamvadi Centre, with the Dist. Off.
in the current year's budget of the Dept. of Sk

vide Ky 2 —

10/4/30
Secretary to Government.

To the D.C. Mysore with records.
The Dist. Off. of Sk.

Jrc 157-4-8

NOTIFICA

Under Section 6 of the Land Acquisition Regulation, No. VII of 1894, it is hereby declared that the land
for the Babanavar spinning Cantra.
and under Sections 7 and 9 (c) of the said Regulation, the Assistant Commissioner in charge of..the Nanja
A plan of the property will be available for inspection in the Na

District	Taluk	Hobli	Village	Name of khatedar or owner	Survey Number or Muni. No.	Whether dry, wet, garden, vacant site, house (tiled, terraced or mud-roofed)	Total extent		Kharab		Remaining extent		Assessment	
1	2	3	4	5	6	7	8		9		10		11	
							A. or yds.	g. or ft	A.	g.	A. or yds.	g. or ft.	Rs.	a.
Mysore	Nanjangud	Kasaba	Badavanaval	Shanbhogue Mantte.	11.	Dry	4	18		10	4	8	3	12
				Shanbhogue H.S. Srinivasiah										

WD 01626-

To

The Compiler, *Mysore Gazette* for publication in three successive issues of the Gazette.

ತಾರೀಖು.....

ನಂಬರ್.....

ಅಸ್ತಹಂ...

1894 ನೆಯ ವರ್ಷದ 7ನೆಯ ನಂಬರ್ ಲ್ಯಾಂಡ್ ಅಕ್ವಿಸಿಶನ್ ರೆಗ್ಯುಲೇಷನಿನ 6ನೆಯ ಪ್ರಕರಣವನ್ನನುಸರಿಸಿ ಇದರಿಂದ ವ್ಯಸ್ತ..... ಪಡಿಸುವದೇನಂದರೆ :—

ಅವಶ್ಯಕವಾಗಿದೆ ; ಮತ್ತು ಮೇಲ್ಕಂಡ ರೆಗ್ಯುಲೇಷನಿನ 7 ಮತ್ತು 3 (c) ಪ್ರಕರಣಗಳನ್ನನುಸರಿಸಿ.....

ತಿಸ್ಸೆ ಸಂಖ್ಯೆ	ತಾಲ್ಲೂಕು	ಹೋಬಳಿ	ಗ್ರಾಮ	ಖಾತೇದಾರನ ಯಾ ಮಾಲೀಕನ ಹೆಸರು	ಸರ್ವೇ ನಂಬರ್ ಅಥವಾ ಸರ್ವೇ ನಂಬರ್ ಗಳನ್ನು ಸೇರಿಸಿರುವ ನಂಬರ್	ಖರೀದಿ ಯಾ ಖಾಯಂ ಆಗಿ ಯಿತ್ತಿನ ಜಾಗ ಅಥವಾ ಜಾಗಗಳ ಹದ್ದು (ಹಿಂಚಿನ, ತಾತ್ಕಾಲಿಕ ಯಾ ಖಾಯಂ ಆಗಿರುವ ಗುರುತುಗಳ ಮೇರೆ)	ಒಟ್ಟು ವಿಸ್ತೀರ್ಣ		ಖರೀದಿ ಯಾ ಖಾಯಂ ಆಗಿ ಯಿತ್ತಿನ ವಿಸ್ತೀರ್ಣ	
							ಎಕರೆ. ಗುಂಟೆ ಯಾ ಗ.	ಅ.	ಎಕರೆ. ಗುಂಟೆ ಯಾ ಗ.	ಅ.
1	2	3	4	5	7	7	8		9	10
				ಶ್ರೀಮತಿ ಭಾಗೀರಥಿಬಾಯಿ.						
				ಶ್ರೀಮತಿ ಭಾಗೀರಥಿಬಾಯಿ ವಿಠ್ಠಲ್ ಸಿಂಧೆ.	11	ಖುಷ್ಕಿ	4	18	0 10	4 — 8
				ಶ್ರೀಮತಿ ಲಕ್ಷ್ಮಿಬಾಯಿ ಅಂಬ್ಯಾಳಕರ.						

ಇದು ಗೆಜೆಟ್ಟಿನಲ್ಲಿ ಪ್ರಸಿದ್ಧಿಪಡಿಸುವದಕ್ಕೂ ಸ್ಥಳದ ಗೆಜೆಟ್ಟಿನ ಕಾಪಿಗಳಿಗೂ.

WD 01678-

2

ಕಾವಲಿರುವ ಜಮೀನನು ಸರ್ಕಾರಿ ಕೆಲಸಕ್ಕೆ ಎಂದರೆ ..... ಆಜ್ಞೆಗಳನ್ನಲ್ಲಿರುವ ಅಸಿಸ್ಟೆಂಟ್ ಕಮ್ಮಿಷನರಿಗೆ ಸದರಿ ಜಮೀನನ್ನು ಹೊಂದುವುದಕ್ಕೆ ಕ್ರಮಜರುಗಿಸಲು ಅಧಿಕಾರ ಕೊಟ್ಟಿದೆ.

ಕಲ್ಪಿಸಿದೆ

ಸಂಖ್ಯೆ	ಈಗ ಸರ್ಕಾರಕ್ಕೆ ಬೇಕಾಗಿರುವ ವಿಸ್ತೀರ್ಣ		ಚತುರ್ಗಡಿ				ಷರಾಗಳು
	ವಿಸ್ತೀರ್ಣ	ಕಂದಾಯ	ಪೂರ್ವ	ಪಶ್ಚಿಮ	ಉತ್ತರ	ದಕ್ಷಿಣ	
	ಎಕರೆ. ಗುಂಟೆ. ಯರ. ಚ. ಅ.	ರೂ. ಆ. ಪೈ.					
11	12	13	14	15	16	17	18
3	12 3 4 - 8	3 12 3	ಸ.ನಂ. 10	ಕೆರೆಯ ಕೆಳಗಿನ ಮಣ್ಣಿನ ಕೆಳಗಿನ ಕೆಳಗೆ	ಸ.ನಂ. 12.	ಸ.ನಂ. 5. ಮಣ್ಣಿನ ಕೆಳಗೆ ಕೆರೆ.	

B Munishwar
Sub Dicision officer
Manjaegud Sub Dicision
10
22/1/80.
7.2.

Received my
the Reforence
reference

ಆಜ್ಞೆಯಂತೆ ನೋಡಿಕೊಳ್ಳಲಾಗಿದೆ,

ಮೈಸೂರು ಸರ್ಕಾರದ ಜನರಲ್ ಮತ್ತು ರೆವಿನ್ಯೂ ಸೆಕ್ರೆಟರಿ.

2B—2,310—26.0-29

ತಾರೀಖು.....

ನಂಬರ್.....

ಇಸ್ತಿಹಾ

1894 ನೆಯ ವರ್ಷದ 7ನೆಯ ನಂಬರ್ ಲ್ಯಾಂಡ್ ಅಕ್ವಿಸಿಷನ್ ರೆಗ್ಯುಲೇಷನಿನ 6ನೆಯ ಪ್ರಕರಣವನ್ನನುಸರಿಸಿ ಇದರಿಂದ ಪ್ರಸ್ತಾಪಿಸಿದ ವದೇನಂದರೆ :-

ಅವಶ್ಯಕವಾಗಿದೆ ; ಮತ್ತು ಮೇಲ್ಕಂಡ ರೆಗ್ಯುಲೇಷನಿನ 7 ಮತ್ತು 3 (c) ಪ್ರಕರಣಗಳನ್ನನುಸರಿಸಿ.....

ಹಸ್ತಾಕ್ಷರ	ತಾಲ್ಲೂಕು	ಹೋಬಳಿ	ಗ್ರಾಮ	ಖಾತೇದಾರನ ಯಾ ಮೂಲೀಕನ ಹೆಸರು	ಸರ್ವೇಯಾ ನಂಬ್ಲಿಸಿಸಲೆ ನಂಬರ್	ಮುಸಿಸ್ಕು ಹಿರಿ ಯಾ ಬಾಗಾ ಯಿತ್ತನ ಯಾ ಖಾಲಿ ನಿವೇ ಹನ, ಜಾಗ (ಹೆಂಟೆನ ಕಾರ್ಸಿಯ ರಯಾಮಾಣಿ ಳ ಭೂಮಣಿ) ಮನೆ	ಒಟ್ಟು ವಿಸ್ತೀರ್ಣ		ಪರಿಹಾರ		ಬಾಧಿಸಿದ ವಿಸ್ತೀರ್ಣ	
							ಎಕರೆ. ಗುಂಟೆ ಯಾ ಗ.	ಅ.	ಎಕರೆ. ಗುಂಟೆ ಯಾ ಗ.	ಅ.	ಎಕರೆ. ಗುಂಟೆ ಯಾ ಗ.	ಅ.
1	2	3	4	5	7	7	8		9		10	
ವಿಚಾರಿಸಿದವರು. ಕಂ. ಸಹಾಯಕರು.	ದೇವನಹಳ್ಳಿ	ಕಸಬಾ	ಕಾಚಹಳ್ಳಿ.	ಕಾಚಹಳ್ಳಿಯ ಗಂಗಾಂಬಿ. ಕಾಚಹಳ್ಳಿಯ ವಿಚ್.ವೆಂಕಟಿ. ಕ್ರೈಸ್ತರು ಸಂಪ್ಪನವರು.	11	ಖುಷ್ಕಿ	4	18	0	10	4	8

WD 01673-

ಮೈಸೂರು ಗೆಜೆಟ್ಟನಲ್ಲಿ ಪ್ರಸಿದ್ಧಿಪಡಿಸುವದಕ್ಕೋಸ್ಕರ ಗೆಜೆಟ್ಟಿನ ಕಂಪ್ಯೆಲರಿಗೆ.

App. F. IX-4

Previous References 1929-30 (314)

File No. 94-29

Serial Nos. 1-2

Later References PRESERVED

General and Revenue Secretariat.

Serial Nos. Two

P

30

Part B for 1929.

SUBJECT

Distribution of printed copies of the A.-... Chatterton on certain industries and industrial Concerns.

REPLY

(To be written on this margin.)

M.20.

OFFICE OF THE FIRST MEMBER OF COUNCIL.

NOTE.

Dated 9th July *192*9.

Has the printing of Sir Alfred Chatterton's Notes been completed? The members of the Legislative Council asked for copies of these notes and it was stated that they would be supplied to them.

9.7.29

Development Secretary
with compliments.

GEN. SECRETARIATE
299
10 JUL 1929
DEVELOPMENT BRANCH

9 7 29

Eng

2) printed copies have not yet been rec'd. from the Govt. Press. The Supt. Govt. Printing was reminded yesterday to intimate in what stage its printing ~~stands~~ stood. He has also been requested to expedite supply of the copies. As copies are to be supplied to L.C. members 50 copies more will also be got printed.

4) Yes
11.7.29

3) This may be for 'date'.

OFFICE OF THE FIRST MEMBER OF COUNCIL
15 JULY 1929
No 391

5) Dev. Secy) Subject for info

Eng 11/7/29

1st

(1st Member)

19/7/29 for Eng 19/7/29

19.7.29 13 7 29 Eng 19/7/29

REPLY

(To be written on this margin.)

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Development Secretary
with compliments.

DEV. SECRETARIAT
299
15 JUL 1929
DEVELOPMENT BRANCH

9/7/29
avg

1) printed copies have not yet been rec'd. from the Govt. Press. The Supt. Govt. Printing was reminded yesterday to intimate in what stage its printing ~~stands~~ stood. He has also been requested to expedite supply of the copies. As copies are to be supplied by L.C. members 50 copies more will be required.

2) Yes

11.7.29

3) This may be done.

OFFICE OF THE FIRST MEMBER OF COUNCIL
15 JULY 1929
No 391

dev. Secy) 4) Subject for info

avg 11/7/29

19/7/29 1st

1st Member) 5) 17.7.29 13/7/29

avg 19/7/29

Serial No.

7/ 147 copies of the Notes by Sir A. Chatterton have since been rec'd from the press & they will, if appd, be distributed as follows—

Servants office	6 copies
Members' offices (2 each)	6
L.C. Members (Non-official & Ex-officio)	50. } was this promised?
Directors of Industries	10
Collrs. of Districts	8
Economic conference office (for being sent to Ec. Supdts.)	10.
University	2
Bhadravati Iron Works	2
Director of Mines	1.
Mr. V. Rangaswamy Iyengar (Who has asked for a copy)	1 Sent 30/7
Sir K. P. Puttanachetty (as agreed separately)	1 "
	97

8) The remaining copies will be sent to the Records. As at present it does not seem necessary to get 50 copies more printed.

Mr. Mitra
22.7.29

Yes, please

Secy
24/7/29.

9/

Please distribute 47 copies + note on my remark.
Hasnt Sir A Chatterton
six copies asked for, & few sent already. 25 copies ?

25-7-29

10) I wd suggest that this might be circulated as Confdl, and that the persons

WD 01684—GPB—30,000—20-4-29

General and Revenue Secretariat. | File No. of 192 .

Serial No.

OF THE
CIL
6 JULY 1929
No. 625.

whom it is supplied might be apprised of the fact. The word "Confidential" might be printed on the cover

1st. Member

25-7-29

11) Yes

Mrs
26.7.29

12) Please get this done - & distribute copies under a covering letter

28/7/29

13) Draft DO ordd

29/7

14) Shall we the Persian word "confidential" be printed as per Secy's orders on the cover of each copy before distribution? Please say.

Eng 29/7/29

15) Issue

Eng 30/7/29

To the Dir. Pr.
" Dte Engrs.
" Regr Regd. Soc.
" Secy. on D.D.
" Dir. of Geology
" Sir K.P. Puttanna Chetty

M.D. 1102-15 of 1-8-29.

NOTE—Contn. Sheet.

The printed Note and Request that it may be the

4

Serial No.

1b/ Copies have been distributed as per orders at para 7 except to the Ld members. A copy of the Notes has been sent to each of Hon'ble Rangaswami Mudaliar and Sir K.P. Puttanna Chetty also.

17/ It is a point for order if a copy may be sent also to the following officers.

1. Dir. I.O.F.
2. Secretaries to Govt.
3. Chief Conr. of W.I.
4. Ch. Elec. Engineer
5. Ch. Engineer K.R.S works
6. Dir. of Agri.

18/ After orders as to the above, the file may be sent to the R.H. the Secy. to note on the opinion of the Secy. at para 7.

3/8.

Dlr Secy

3/8 Eng 3/8/29

Instructions issued

19/ Copies may be sent as indicated in the office note

3 8 29

Eng

To The Dir. I.O.F.
" Chief Secy
" Genl. "
" Fin.
" Chief Conr. W.I.
" " Elec. Engr
" Engineer. K.R.S.
" Genl

No. D. 1382-90 26.8-29.

With a copy of the Notes.

Note—Contn. Sheet

WD 01684—GPB—30,000—20-4-29

Serial No.

29 The file may now be sent to the R.A.L.C. Secn. for noting on the remarks of the Dev. Secy. at para 7 supra.

13/8. (R.A.L.C. Section)

An extract from the L.C. proceedings bearing on this matter is put up. (Flag R)

13/8/29.

After perusal, the file will be sent to the Dev. Secy.

13-8-29

Dev. Secy. with compliments

13.8.29

Copies of the Simon Note of Sir A. Chatterton were promised to be supplied to the L.S. members, if desired.

Subd. for orders.

13/8.

Copies may kindly be given when required by the individual members.

Dev Secy

13/8

Yes

21-8-29

Note

21/8/29

R.

B

GEN'L & REVY. DEPARTMENTS

MAR

DEVELOPMENT BRANCH

WD 01684—GPB—30,000—20-4-29

STATEMENT OF CASES SUBMITTED FOR THE ORDERS OF HIS HIGHNESS THE MAHARAJA DURING THE TOUR OUTSIDE THE STATE IN ..... JULY 1929 .....

Register No.	Subject	Orders of His Highness	Order regarding submission of files (*vide* foot-note)
56 30-7-29	Sir Alfred Chatterton's Notes on certain industries and industrial concerns of the State.	Seen by His Highness Secy to Pres for Private Secy 17/8/29	C

NOTE.—The letter a, b or c may kindly be inserted by the Private Secretary to His Highness in the last column to indicate whether
File may be submitted at once .. .. a
File may be submitted after His Highness' return .. .. .. b
File may not be submitted at all c

7

Submitted to His Highness.

I beg to submit for the gracious perusal of His Highness two copies of Sir Alfred Chatterton's Notes on certain industries and industrial concerns of the State.

Mirza M. Ismail

D E W A N.

Bangalore,)
29th July 1929.)

H.H.56
30.7.29.

JSW

Pleas to submit for the pleasure
personal of H.H. two copies
of Sir Alfred Chatterton's Note
on certain Industries and
Industrial Concerns of the
State

29 7 29

NOTES BY SIR ALFRED CHATTERTON.

NOTES BY SIR ALFRED CHATTERTON.

The Government Soap Factory, Bangalore.

1. With the Director of Industries, I inspected this Factory on the afternoon of the 25th February. Mr. S. G. Sastry, who is in charge of the Factory and is mainly responsible for its development, was present and furnished all the information I asked for. The factory is the outcome of experimental work on soap boiling with local materials which was initially carried out in the Applied Chemistry Department of the Indian Institute of Science at the expense of the Government of Mysore about the year 1915. Beyond recording this fact which seems to have been forgotten, I do not propose to enter into the history of the Factory.

2. The premises now occupied are well suited for the work and are spacious enough to allow of a very considerable increase on the present output which for the last six months was 100 tons or at the rate of 200 tons per annum. The Soap Boiling house would be more convenient if it were so much loftier as would enable an extra platform to be erected. The accommodation for packing is excellent and there is plenty of room to install extra milling plant when required. The disposal of the effluent from the factory can only be effected by letting it run in an open drain which passes through the Cubbon Park. This is not satisfactory, but it is not easy to remedy. Probably the least objectionable method of dealing with it would be to store it for a week at a time in a small reservoir behind the factory when all the solid matter would settle and could be removed from time to time whilst the clear effluent could be released at night. I may add that the effluent is not of an offensive character.

3. The Soap made in the Factory is of excellent quality and the number of grades is wisely limited. The packing which is an important matter in the Soap Industry whilst cheaply done is of sufficiently good quality. I have been furnished with the following statement by Mr. S. G. Sastry :—

"The Factory has paid to Government in the form of interest till the 30th June 1928 a sum of Rs. 63,651. Besides this, the Factory has earned a net profit of Rs. 84,469. Further, there is a depreciation reserve of Rs. 41,958. The amount invested by Government in the Soap Factory is Rs. 83,550."

I understand these figures relate to a period of 9½ years beginning on the 1st February 1919. Without a great deal of explanation they are not of much use in throwing light on the commercial value of the results obtained but they clearly indicate that the industry has more than paid its way over a fairly long period and that it has not involved the State in any loss.

4. To ascertain the position at present reached, I have obtained copies of the accounts for the half-year ending 31st December 1928. The amount of soap sold was roughly 100 tons and the sale proceeds amounted to Rs. 1,13,200-6-9. The net profit shown in the Balance Sheet is Rs. 11,783-4-9 to which for commercial purposes should be added the interest paid to Government on the capital amounting to Rs. 2,775-4-0 or a total of Rs. 14,558-8-9. It is not easy to arrive at the capital as the Balance sheet shows that the Fixed Capital is about Rs. 79,500 and that the Factory enjoys a Cash Credit in the Treasury, the maximum amount allowed being Rs. 1,11,058-2-2, but of which only Rs. 47,000 was employed on the 31st December 1928. It will probably be not unfair to assume that the average capital employed during the half-year was 1½ lakhs and that the net profit was just under 10 per cent or at the rate of 20 per cent per annum. This is a creditable result and would suggest to the uninitiated that the industry is now on a sound commercial basis. It is however necessary to point out that some of the charges incurred by the Factory are not actual commercial charges but are debits arbitrarily fixed by Government order, whilst other charges which a commercial concern would have to meet are not incurred in a Government Department.

5. I now proceed to note some of these items—

(i) Only half the pay of Mr. S. G. Sastry is debited to the Factory, *viz.*, Rs. 350 and that is insufficient. To run the factory should be a whole-time job and Rs. 700 a month is not an unreasonable charge.

(ii) The rent charged to the factory is only Rs. 100. Value of the premises at only Rs. 40,000 and allowing 9 per cent for rent, the rate would be Rs. 300 a month.

(iii) Interest is calculated at 5½ per cent, whereas a commercial concern would have to pay an average of at least 8 per cent in Bangalore.

(iv) No charge is made for Direction. It is under the Director of Industries who occupies a position analogous to a Board of Directors under a firm of Managing Agents, or under any other adequate form of control and management. These charges would come to at least Rs. 500 a month.

(v) Income-tax.

Adding these five items together, we have:—

	Rs.
(i) Salary of Manager	2,100
(ii) Rent	1,200
(iii) Extra interest	2,750
(iv) Managing Agency	3,000
(v) Income-tax	250
Total ..	9,300

Deducting this amount from the Balance sheet figures would leave a profit available for distribution of about Rs. 5,259 for the six months equivalent to nearly 7 per cent for the year. I need hardly say that businessmen would not consider this a commercial proposition. This is due to too small a turnover and steps should be taken to increase it as rapidly as sales permit to at least 400 tons a year. If this result cannot be obtained, it is not likely that the Factory will ever be taken over by private enterprise.

6. Such being the case, I do not recommend that the Factory should be transferred to a new site. The cost of transfer is estimated roughly at 1½ lakhs and I consider there is no necessity to incur this expenditure. The present plant can be overhauled—what it will cost I cannot say. Mr. Sastry estimates it roughly at Rs. 40,000, but I am inclined to think nothing like so large an expenditure is necessary, but it will be easy to get a detailed estimate prepared and it should be done on a basis of 400 tons output. This expenditure can be met from the amount already set aside for depreciation.

7. I would also add that, in future, charges against the Factory should be made as pointed out in para 5 so that a true commercial view may be obtained of the operations. The pay of the Manager should be a fixed salary plus a liberal commission on the net profits. To obtain commercial results, commercial inducements must be offered and I am sure that when a man's earnings depend to some extent on his own actions, he will work more energetically and continuously to obtain as much as possible.

Handloom-Weaving.

My task in dealing with this important industry has been greatly simplified by the "Note on the Industrial concerns under the Department of Industries" which has been written by Mr. C. Ranganatha Rao. In it he has discussed at some length the question of the cost of maintaining the Government Weaving Factory and in an Appendix marked "D," he has given a very clear account of the work done in the Factory and its effect on the Industry throughout the State. I am in entire agreement with him that this factory should not be regarded as a commercial undertaking and that it should not be judged either by the sale proceeds or by the Annual Balance Sheet. It would be better to call the Factory "A Weaving Institute" and thus eliminate the idea that it should be worked on commercial lines. During the last nine years, the average annual cost of maintaining this Institution has been Rs. 15,000 and the only question which should be asked is "Has the State received an adequate return for the expenditure." A persual of Appendix "D" supplies, I think, an unqualified answer in the affirmative.

2. On the 26th February, I visited the so-called factory which has, about a year ago, been removed to the present very commodious and suitable premises which are fronted by a very convenient show-room in which the products of the looms are offered for sale. The work in a properly conducted Weaving Institute involves the use of a large quantity of valuable material and it is right and proper that the sale of finished products should be made to defray a large part of the cost of not only the material but of the labour in working it up. Efficiency on this point is highly important to keep down charges, but the main aim of the Institute should not be to make a profit but to do such work and render such service to the handloom industry as will improve its status and increase its returns. In Mysore the functions which I would assign to a Weaving Institute may be concisely stated:—

(1) The training of weavers both as artisans and as Master Weavers.

(2) The improvement of the technique of weaving by experiments with new appliances.

(3) The demonstration of the value of the improved appliances or processes by working them on a sufficiently extensive scale to yield results which will be appreciated by practical men in the trade.

(4) The development of silk weaving and the demonstration of the value of the improved silk produced in the Government Filature, Mysore.

(5) The production of new patterns and artistic designs.

Lastly as an offshoot of the work done in the Institute, it should send out peripatetic parties to give demonstrations in those rural tracts where handloom weaving is carried on. Work of this kind under all the heads enumerated above is now going on—as to the value of the work all that I can say is, that the expert staff is poorly paid and that as workmen, they are worthy of their hire. If more is to be obtained from the Institute, it will be necessary to place at its head a better qualified Superintendent who will certainly require a much higher salary.

3. The problems presented by the handloom weavers have been studied in every Province of India during the last 25 years and without question, the sum total of the results achieved is not very encouraging. We have made fly-shuttles popular, we have introduced improved methods of preparing warps, the use of dhobbies and jacquard machines is slowly spreading, a number of handloom factories have been started and a fair proportion of the later ventures have been successful. We have also notably in Mysore brought about the establishment of small powerloom factories which are steadily increasing in number and this development is almost entirely due to the facility with which electric energy can be obtained. On the other hand, though the handloom weaver is holding his own in competition, or perhaps more accurately stated, in resisting the inroads of the powerloom factory, there is, I think, but little evidence to show that he is materially better off. This must be attributed to the lack of organisation in the Industry and to no other cause.

4. The Director of Industries has reprinted as Appendix "E" to the note referred to above, a memorandum on Handloom Weaving which I wrote for Government in 1918. I still adhere to what is there stated except on one very important point. I wrote, "Primarily, the most important matter is to organise the industry, *to take steps to deliver the weaver from the hands of the Sowcar* and to provide him with a market for his goods." The attempt to deliver the weaver from the clutches of the sowcar has been made in many ways and has always signally failed. Co-operative Weaving Societies have been started but they have invariably after a time got under the control of the sowcar. In some cases, temporarily a considerable success has been achieved but it has always been through the instrumentality of some outsider, who has taken the society under his wing and when he has been no longer able to control it there has followed a lamentable collapse. I am now of opinion that all along we have made the mistake of trying to get the weaver out of the hands of the sowcar. We have given the sowcar a bad name and have not recognised the useful part which he plays in the economic organisation of the country. The term sowcar has come, probably in most cases, very unfairly to connote a hard-hearted usurer. In the Weaving Industry, he is really an *entrepreneur*, a middleman between the weaver and the general public. He provides finance and gives employment. He is the master and they are the workmen, often tied to him by debt. The weavers are ignorant, improvident, untrustworthy and need to be coerced. The sowcar knows them and is able to keep them under control but he equally well knows that the benevolent efforts of Government are ill-conceived to effect any lasting improvement in the condition of the weaver and so he adopts an ultra-conservative attitude with his men and thwarts all our efforts to do anything. If this be true, it seems obvious that we should change our policy and endeavour to influence the sowcar and through him, work out the improvement of the weaver. At present, he is the master-mind under which the weavers work and so long as we attempt to undermine his position, he will be against improvement. But if we work through him and recognise him as the natural head of weavers, it is hardly likely that he will oppose the introduction of new conditions which in the first instance will benefit him.

5. This is a complete revolution in the generally accepted policy as to development of the Handloom Industry. It is at present merely a new suggestion which must be examined on its merits. Let us try and establish friendly relations with these gentlemen whom hitherto and unfairly in most instances we have regarded as harpies. As a class, they are shrewd businessmen, able to conduct affairs on a fairly large scale, students of weaver-human nature and reputed not to be averse from increasing their wealth and status. If we recognise them as the natural teachers of the people we have been trying to deal with, we may achieve more in a year or two than has been possible in the last quarter of a century.

6. I am not prepared to submit any formal programme by which we may hope to attract them. We may be able to induce them to send sons or relatives to the Institute for short course of instruction in weaving economics and pattern design. It should be possible to interest them in new appliances but it is not likely that they will learn to work them. At the outset the aim should be to get them interested in the work and create a feeling of

confidence that Government is prepared to render them assistance in any reasonable way. It may be said that this will not help the weavers but if through the agency of the sowcars the whole technique of the Industry is gradually placed on a higher plane, if the sales organisation is developed, if central warping houses are established, if any measure of standardisation of pattern and quality is arrived at, then it is certain that the weaver will acquire increased skill and steadier employment, that overseers and supervisors will be required and that these men will be trained in the Weaving Institute. If we adopt this new policy, it will be comparatively easy to meet in a thoroughly adequate manner all the demands for advice and technical help which are likely to be made.

7. As a preliminary move in this direction, some half-a-dozen of the leading men interested in the handloom industry were invited to attend a meeting in the Director of Industries' Office. It was explained to them that we were desirous of co-operating with them to advance their business and improve the condition of their workers. They were asked to consider how we could best help them and they promptly replied that they were in need of new patterns and designs. We showed them a number of silk patterns recently received from Switzerland and some sample pieces of silk which had been made from Mysore silk on the Swiss looms. These were all very eagerly examined and appraised. They expressed a willingness to take over at cost price a range of sample silks if the Department would get them made. Other matters of general interest to them were discussed and the meeting finally terminated with an expression of thanks from them for the new departure. The Director of Industries, who knows these people better than I do, is of opinion that a good start has been made which he intends to follow up. It will doubtless take time to get them to work with us, but as the Director of Industries is convinced that he can get a great deal achieved through them, I am satisfied that with patience and a ready response to their enquiries progress will be made.

The Sowcar.

The Director of Industries has informed me that Government desire that proposals for practical action should be submitted in connection with my suggestion that the agency of the sowcar should be utilised for the development and improvement of the Handloom Industry. I would draw attention to my note on Sericulture and Silk which contains detailed proposals for the improvement of the Silk Weaving Industry. I also suggested a certain line of action in regard to the supply of new designs. After the note on Handloom Weaving was submitted to Government, the Director of Industries called a meeting of the leading sowcars interested in the Industry and we discussed what could be done. They expressed approval of our proposals in regard to setting up in the Handloom Weaving Factory the very latest models of machinery for weaving silk fabrics from Mysore Silk. They were unable to give us any useful suggestions regarding the preparation of new designs but they desired that we should devise means whereby new patterns could be submitted to them. It would be one part of the work of the Handloom Weaving Factory to prepare new samples for submission to merchants and from these samples, they will be able to come to a conclusion as to whether large orders can be placed.

It is important to point out that in bringing the sowcar under consideration, we do not really make any change in the methods by which we are attempting to raise the status of the Handloom Weaving Industry. The work to be done is in no way altered, but instead of going to the weaver and trying to get him to adopt improved methods, we should bring to them notice of the Capitalist Sowcar interested in manufacture and demonstrate to them the advantages that will accrue from changes which the Department may desire to make. It is obvious at first, the sowcars will be somewhat slow to take advantage of the new situation, but as soon as they realise that Government is out to help them, there is no doubt that they will freely come forward with their own suggestions. I would also invite attention to my note on the Arts and Crafts in Mysore in which I have suggested that the Mysore Chamarajendra Technical Institute should be made a centre of Art life in the State and it seems to me that the Arts School which I recommended to be established would naturally devote considerable amount of attention to the production of textile designs.

I have already drawn attention to the establishment of small power loom factories in Bangalore, the most successful of which appear to be managed by sowcars and it is in this direction that I look for further developments, in the immediate future, of considerable importance. In a State like Mysore where Electrical energy is in course of distribution over very wide areas, our object should be, as far as possible, to eliminate from the lives of the people tedious labour. There has been in the past much sentimental rubbish talked about the produce of the handloom weaver and that it is a pity that he should succumb to the powerloom. I have a very intimate acquaintance with the life of the handloom weaver and the best I can say is that the occupation is dreary, monotonous and extreme. It is possible that his lot is not worse or better than that of the men employed in the powerloom factories, for on the whole it is more precarious. The small powerloom factory which is growing up in Mysore provides the best solution of the problem. It is possible to get looms driven by power in which everything can be done

that can be done on a handloom and at the same time with less labour and much greater despatch. The progress made in this direction is very satisfactory and I am certain that it will increase if the Department of Industries is allowed to adopt the policy of carrying out in the initial stages all developments which the sowcars at present are nervous of undertaking.

Sugarcane Cultivation under the Krishnarajasagara.

The problem which I propose to discuss in this note is what policy should be pursued to obtain the maximum economic advantage from the very large expenditure which has been incurred on and which will yet be incurred to complete this combined hydro-electric and irrigation project. The works are estimated to ultimately cost Rs. 641 lakhs, of which approximately Rs. 400 lakhs have already been expended involving interest charges which calculated at 5½ per cent amount to Rs. 24 lakhs per annum. The hydro-electric developments have been carried out and the capacity of the Sivasamudram Station has been increased by 36,000 horsepower. At this moment, I have not before me any information of recent date as to the extra revenue which is now earned by the Sivasamudram Installations, but it is estimated to ultimately amount to Rs. 30 lakhs and is probably now about two-thirds of that sum. The interest charges are not therefore a serious burden at the present time, but they will rapidly increase and after the sanctioned programme of work is completed, they will be very heavy and it is necessary that the irrigation returns should as rapidly as possible be developed to meet them.

2. In July 1927, Government appointed a Committee to advise them as to the measures necessary for the development of irrigation under this reservoir and the valuable report submitted by that Committee was accepted by Government and the requisite orders passed giving administrative sanction to the recommendations contained therein.

3. In this report, the Committee stated that the water available for irrigation would be 35,718 million cubic feet or sufficient for an area of about 120,000 acres assuming that in each year, one-third of the land was under sugarcane with a duty of 2½ acres per million cubic feet, one-third under paddy with a duty of 4 acres per million cubic feet and one-third under garden crops with a duty of 10 acres per million cubic feet. This works out at an average of 4 acres of irrigation per million cubic feet, on the assumption that the areas under each kind of crop are equal. On this basis, 120,000 acres will require 30,000 million cubic feet of water and there is a margin of 5,718 million cubic feet or nearly 20 per cent to allow for contingencies and for possibly excessive cultivation of sugarcane. This is, I consider, a very reasonable and even somewhat conservative estimate of the duty that may be expected from the water and I do not in any way share the opinions of some who have thrown doubts on the possibility of realising these estimates.

4. Near the conclusion of their report the Committee stated: "No pains should be spared to develop irrigation in accordance with the latest practices and with an eye to the highest returns. The policy indicated in this report should be steadily pursued for at least 15 years from the date Government begin to give water for irrigation." From this I conclude that the Committee consider that 15 years will be necessary to bring the ultimate area under irrigation and one member taking a less favourable view in a separate note would extend the period to thirty years. The history of the development of irrigation in the Madras Presidency especially under the Godavari and Kistna systems furnishes ample warrant for such views and I have but little doubt that unless special measures are taken, there will be a comparatively slow expansion of irrigation and that the adoption of block systems with a triennial rotation of crops will tend further to extend the time. I am nevertheless in favour of the principle of the block system as being in the long run calculated to give the best return.

5. It appears to me however that this irrigation project affords an unprecedented opportunity for the adoption of a new policy which will carry the idea, the germ of which appears in the block system, to its complete development. The essential feature of the block system is a triennial rotation of crops to which the cultivator is made to conform in his own and in the general interest. One of these three crops is sugarcane, which is estimated to yield a return of Rs. 500 per acre, as compared with Rs. 80 for paddy and Rs. 50 for garden produce. It will be agreed that sugarcane is a capitalist crop and that to realise the large return given above will involve proportionately heavy cultivation expenses. To avoid controversy, I will not suggest a definite figure. But that is not all. When the crop is ripe, it must be crushed and the resulting juice boiled down to jaggery by the cultivator or the canes sold to a mill for the manufacture of sugar. Years ago, I worked out in Coimbatore that a pair of bullocks will crush an acre of cane in three weeks and I formed the opinion, both there and later in Mysore, that the lack of cattle power was one of the reasons that restricted the area of cane cultivation.

6. I think we may assume that the cultivators under the lands commanded by the High Level Canal are mostly without resources and quite unable to find the capital necessary to engage in sugarcane cultivation. They may be able to borrow a little

money but it is quite certain that without extraordinary measures to help them, the development of sugarcane growing will be very slow. Moreover, when cane is grown, there will be the difficulty of crushing the crop and when all obstacles are overcome, of the realisable profits a large portion will be absorbed in interest on advances.

7. I have for a long time held the view that India is not self-supporting in the matter of sugar because the cultivator of sugarcane has perforce also to be a manufacturer of *gur*. I do not think it is necessary now to elaborate this proposition but I would point out that the more intensive the cultivation of cane and the higher the percentage of land under this crop, the greater are the disadvantages under which the indigenous system labours. We are now contemplating 33 per cent of the cultivated area being under sugarcane and I agree with the dissentient member in his pessimistic outlook. But unlike him, I do not accept the situation as I think that it is extremely easy to provide remedies for all the difficulties which normally the cultivator will have to face if left to himself.

8. My proposal amounts to this—that Government should come to the aid of the cultivator and should provide him with financial assistance to grow sugarcane, that Government should take over his crop when it has been cut and that they should provide the machinery to crush it and work it up into a marketable product and that finally, they should place the product on the market. If this is agreed to, the work should be taken in hand at once and preliminary arrangements made so that directly water is let into the Canals, which I understand will be in 1931, a large area of sugarcane can be started. At this stage, it would be quite useless to discuss in detail how these operations can be carried out. As a matter of fact, there should be no difficulty about them and the details can be varied to suit local needs and will certainly be subject to modification as experience accumulates. It does however appear to me to be necessary to clearly indicate what financial responsibility Government will incur and what benefits will accrue to the cultivators and what return will be obtained by the State.

9. The proposal of the Committee accepted by Government amounts to this: that under this irrigation system, the cultivators must agree to put one-third of their land under sugarcane or they will not get water. This is justifiable as without such a provision, no adequate return can be obtained on the expenditure to provide the irrigation water. The cultivator runs no risk of not getting a market for his crop as India imports about 800,000 tons of sugar a year and on this import, there is a duty of 25 per cent. Experience shows that cane can be grown in Mysore and that the conditions, when water is available, are very favourable. There is therefore no more risk in growing sugarcane than any other crop. If Government take over the crop, they take over produce which can easily be sold at the current market prices and they will pay the cultivator for his crop at rates computed by a sliding scale depending on prevailing market rates. The investigations necessary to obtain an equitable sliding scale will not be easy as it will have to be based on the sucrose contents of the cane and one may reasonably anticipate that it will take time to get it to work smoothly. There is considerable experience on this matter available at Nellikuppam in the South Arcot District of the Madras Presidency and in the North of India, where a number of sugar manufacturing companies are at work.

10. All advances made to cultivators should be on a commercial basis and the rate of interest should be one per cent above the average bank rate. I assume for the sake of illustration that it will be necessary to advance the raiyat or cultivator a sum of Rs. 200 per acre of cane for cultivation expenses, for the purchase of seed cane and for manures. Ultimately, with 40,000 acres under cane, such advances would amount to Rs. 80 lakhs but it is important to remember that they will be floating advances, such as if necessary the Imperial Bank or the Bank of Mysore could make, and they will be secured by the fact that the crop when ready will be handed over to Government for conversion into jaggery or sugar. On the basis of Rs. 200 per acre and allowing a period of five years to bring the whole area under cultivation, the amount of finance to be granted will start with about Rs. 16 to Rs. 20 lakhs and will increase annually by that amount but the transactions of each year will be complete in a definite period as the cultivator liquidates his debt by handing over his crop. Only failure of the crop through negligence or unavoidable causes will lead to default and it will be easy to provide an insurance rate to cover such contingencies.

11. To deal with the crop, I would in the first instance advise Government to install 5 roller crushing mills driven by electric power or by oil or gas engines, each with an adequate battery of boiling pans. There is a great deal of experience available as to the working of such plants and they should be of a capacity to deal with about 200 acres of cane in the season. Roughly, I expect they will cost about Rs. 20,000 each or say Rs. 100 per acre. To cover the whole area of 40,000 acres with such plants would involve a permanent capital outlay of Rs. 40 lakhs. But before that area is reached, it is possible that these plants may in some tracts be superseded by large sugar mills and in that case, the displaced jaggery plants can be moved elsewhere. The establishment of large sugar mills should be a subject for later consideration, but it may be assumed that the successful cultivation of cane, on a large scale and with a high degree of concentration, will render them inevitable. Whether they are to be Government Mills or set up by private agency need not now be discussed.

12. The Committee estimate the return from sugarcane at Rs. 500 per acre or at Rs. 2 crores from 40,000 acres and these figures, I accept, save that I think the evidence as to the existence of 40,000 acres of good sugarcane land, is not convincing. It seems to me that it is necessary that a very careful survey of the area commanded should be made by a competent expert staff and unequivocal evidence obtained. That there is a large area, I do not doubt but the actual extent and its classification into grades certainly requires urgent attention.

13. Under this scheme of working the sugarcane cultivation, the raiyat will be relieved of anxiety regarding finance. The local market for jaggery need not be flooded directly the crushing season is over as is usually the case when the raiyat crushes his own cane and there need not be those violent fluctuations in prices which usually occur. In addition, the quality of jaggery can be fairly standardised and that in itself will be an advantage whilst the standard of quality may also be raised as the conditions under which manufacture will take place will be favourable to the production of a high quality.

14. The most important and novel feature of this scheme will be that the whole of the sale proceeds of the crop will pass through the hands of Government and will necessitate the provision of a very competent accounts department to deal with their distribution. The cultivator will be credited with the value of his produce and from that gross value will be deducted all advances made to him during the previous year with the accrued interest charges, together with his total water rate for the area irrigated under the block system. I do not accept the charges proposed by the Committee as equitable to Government, nor do I suggest what they should be, but I do suggest that if the unaided raiyat under the Deccan Canals can pay as much as Rs. 50 or Rs. 60 per acre, it will be equitable to charge a much higher rate than Rs. 15 per acre contemplated by the Committee.

15. It is proposed to recover part of the cost of the project by the levy of 'a contribution' on the land irrigated averaging Rs. 100 per acre and to spread the period of payment over five years. This is in accordance with local custom and I understand will not be objected to but I venture to suggest that it is not sound policy. To levy the whole contribution in the five initial years is to levy it during the time when the cultivator requires all the capital he can command and during the period when it is desirable that he should be given every possible encouragement so that he may learn to appreciate the advantages of supervised cultivation. I would therefore suggest for consideration that the contribution be either dropped entirely and a much higher water rate levied or that it be increased in amount and recovered over a long period of years. I have seen irrigated land increase from Rs. 100 per acre to Rs. 1,000 per acre and I am sure that in the case of this irrigation system, if worked on the lines I have proposed, the land values will increase in at least the same ratio. It is universally agreed now that unearned increments should be regarded as a legitimate source from which public revenue may be derived and it would, I think, be a somewhat short-sighted policy in this instance to follow ancient precedents.

16. I have not adequate data to prepare a financial forecast of the effect of these proposals. The results will depend on the prevailing prices for sugar and jaggery several years hence and though there is no certainty about them, it is hardly likely that they will be lower than at present. The benefits of this scheme should be shared by Government and by the cultivators and, after the whole cost of working it has been debited to the annual income, any surplus profits might be distributed in some predetermined ratio. Merely for consideration, I suggest that since Government bears the financial burdens and thereby obtains unusually cheap finance for the cultivator, the ratio should be 60 per cent to Government and 40 per cent to the cultivators but a very detailed examination might lead to the adoption of some other ratio.

At the present moment, it appears to me undesirable to consider more than the general outline of these proposals which I have now submitted. If they are accepted as a guide to the policy to be pursued, it would then be desirable to appoint a special officer to consider them in detail and devise a working plan. I presume that in some form or other, they will be presented to the Legislative Assembly and that they will only be adopted with popular approval of them as a satisfactory solution of the problem before the Government.

It may not be inopportune to draw attention to the somewhat similar methods adopted in the Sudan under the great reservoir on one of the branches of the Nile to secure a rapid expansion of the irrigated cotton crop. Writing without references, I think that in this case, the Sudan Government have given concessions to a private company which has already financed the whole of the works necessary to deliver the water on to the land and its further assumption of responsibility for the conduct of the cultivation in accordance with the results of modern agricultural knowledge is a comparatively slight matter. Yet it is essential if anything like a reasonable return is to be obtained.

On Friday afternoon, 8th March 1929, accompanied by Mr. B. K. Garudachar, I visited his sugarcane milling and jaggery plant. This is, so far as I know, the first installation to

be driven by electric power and it is a very suggestive example of the developments possible in the future. The area under sugarcane was 18 acres and the crop a very heavy one as intensive manuring had been adopted. The installation consists of a three-roller mill 18" × 12" driven by 9 H.P. electro-motor running at 710 revolutions per minute. The necessary reduction in speed is obtained partly in the mill gearing and partly by driving through a countershaft. The capacity of the mill is about 1½ tons of cane per hour and from the cane, about 72 per cent of juice is extracted, yielding when boiled down 10 per cent of jaggery. In an adjoining shed were 12 boiling pans to which the juice was pumped through pipes. A little extra fuel was added to the megass to complete the boiling down and in this respect only is the plant capable of improvement. The pans if placed in series would more efficiently absorb the available heat and no extra fuel would be required. The plant is worked about 13 hours a day and yields about 160 maunds (28 lbs.) of jaggery. The electric drive is very satisfactory and of course less expensive than either an oil or gas engine. Mr. Garudachar informed me that the whole capital outlay was about Rs. 7,000 and the current consumption 5 K.W.'s for which a charge of anna 1 per unit is made by the electrical department. That is to say, the cost of running this mill for thirteen hours a day is only a little over Rs. 4. It is to be hoped that Mr. Garudachar will be able to undertake milling cane for his neighbours when he has completed his own work. Mr. Garudachar expects to get about 9,000 local maunds of *gur* from this patch of 18 acres of sugarcane and as he is selling the *gur* in Bangalore at Rs. 2-12-0 a maund, the gross realization will be over Rs. 24,000 or an average of over Rs. 1,300 per acre. When the season's work is completed, it will be very useful to get these figures verified. This little venture may be taken as a shining example of how things should be done. It reflects great credit not only on Mr. Garudachar but also on the Electrical Department, which has displayed most commendable enterprise in its efforts to bring power to rural industries.

The Development of Sugarcane Cultivation under the Krishnarajasagara.

I understand that the preliminary work is to be placed under the Secretary of the Krishnarajasagara and that a Revenue Officer assisted by an Agricultural Officer with experience of sugarcane cultivation is to be appointed to start work at once. As the main object of the preparatory stage will be to evolve a system of "Financed Cultivation," it will save a whole year which will be of immense advantage later on, if something can be done to help raiyats who have already planted sugarcane, but have not funds to cultivate and manure it to the best advantage. The Director of Industries informs me that he knows of tracts where this is possible and it would be well if the resources of his Department were utilised to the fullest extent possible especially as some of his men have experience of working jaggery boiling plants on the "Hire system." If only 100 acres were so dealt with this season, it would be of great advantage, but I should imagine it would be possible to get a larger area than that, possibly three or four hundred acres with three or four mills. Cane in most places has not long been planted and if no time is lost, suitable tracts may be brought under control this year.

Apart from this work, however, a careful study of the problems to be solved should be made and I would advise that the Officer to be in charge of the work should be allowed to visit the Sugarcane Farm at Belapur in the Deccan. The Managing Agents of the Company are Messrs. Brady & Co. of Bombay and the local manager, who is said to be a very experienced cane grower, is one Mr. Miller. Later on when opportunity offers, a similar visit to Nellikuppam should be arranged.

The mills to be used for crushing cane should be 5 roller mills with a capacity of about 2 to 2½ tons of cane per hour. Two or three mills should be purchased from good makers and after thorough testing, the best one should be selected as the standard pattern to be copied in the local workshops hereafter. The design of the furnaces and boiling arrangements should also be considered and they should be rendered capable of working without outside fuel.

It will be necessary to allot funds to carry on the work and to make advances for cultivation expenses and the purchase of manure. A preliminary allotment of one lakh should suffice to be increased later if necessary. The soil survey of the area under the Irwin Canal should be revised to determine the ultimate extent of cultivation and to select the most likely tracts in which to make a start having in mind the suitability of the soil, the compactness and extent of the blocks and the attitude of the cultivators. Demonstration farms should be arranged to start cultivation next season, where a water-supply can be assured and the terms should be based on sharing the profits between Government and the cultivators with an assurance that in no case will the cultivator be called on to suffer any loss. These demonstration farms may make jaggery or provide seedlings for the following season. Arrangements will have to be made to provide a sufficient stock of good seedlings for the first year and the Agricultural Officer will have to draw up a programme of cultivation to ensure a supply of properly mature cane for a milling period of at least five months.

It is necessary that a great deal of propaganda work be done to convince the raiyats of the benefit of this "Financed Cultivation" and a capable lecturer or speaker should be provided with lantern slides and other attractions to draw the rural population to listen to him. Mr. B. K. Garudachar should be invited to furnish accurate statistical information as to the results he has obtained at Kyalsanahalli this year and the note prepared on that sugarcane village by Mr. Y. Narasinga Rao may be studied with advantage.

The object of the preliminary work of the first two or three years is to get experience on a small scale that may be utilised when the canal water is available and to train a large staff of assistants in methods and procedure so that development may proceed rapidly and smoothly. At each demonstration farm, frequent invitations should be issued to surrounding cultivators to inspect progress and to receive instruction regarding all that is going on.

Forest Industries.

I have read a very valuable note on "Some problems of the Forest Department" prepared by Mr. M. N. Krishna Rao, the Senior Member of Council. I have also discussed questions of Forest Industries with the concerned officers at several interviews. I have visited the lac factory which is established in the Fort, Bangalore, and I have obtained the opinion of the Professor of Bio-Chemistry in the Indian Institute of Science regarding the prospects of lac cultivation in the Mysore Forests. There appears to be no doubt that lac cultivation can be carried on in Mysore and that the climatic and other conditions are favourable, as there are sufficient number of trees of different species in the forests to give a very large supply of lac. The experimental work has been going on for the last six years and it has been carried out on scientific lines under competent expert advice.

A little more than two years ago, it fell to me to make a rather elaborative investigation of the lac industry of another Indian State. There it was a very important source of Revenue and it possessed well-equipped factories to manufacture lac, but the conditions, under which the cultivation of lac was carried on, were primitive and inefficient. In Mysore, such work as has been done has been on sound lines but the results which have been achieved seem to indicate a lack of energy and driving force in conducting operations. Last year, the total output of lac in the State was about 900 local maunds of crude lac. The expenditure was about Rs. 14,000 and the receipts from the sale of produce were Rs. 9,000, leaving a deficit of Rs. 5,000. This in itself is a very small sum to pay for experimental work, but it is a large amount to lose on experimental work, which is making such slow progress as the lac industry although the conditions are recognised to be unusually favourable.

The Forest Ranger in charge of the work appears to be a capable man. He ought to spend the whole of his time in the Forests on field work but as a matter of fact, he spends half of his time in Bangalore, as he is in charge of the lac factory. This factory is a very small concern at present as it only deals with the lac produced in the State. It might conveniently be placed under the Department of Industries where certain facilities exist for dealing with the problems of working up lac which are not now available in the Forest Department. As an alternative, it would be possible to place the lac factory under the control of the Director of Sandalwood Oil Factories. A new field for experiment and exploration would be interesting to him and the large scale on which he is carrying on one forest industry would necessarily stimulate his vision in regard to the prospects of another forest product. Lac is the basis of innumerable applications in modern industry and it should be the object of any one placed in charge of the lac factory to do something more than send crude lac to Calcutta to be converted to shell lac. This the Forest Department have fully recognised and I think it is possible that the Ranger in charge has given too much of his time to this side of the work. The important thing which seems to be necessary in regard to lac experiments is to carry them on with very much greater vigour and to insist that the output of lac in the State should be doubled each year, till it reaches such an amount as will yield a respectable surplus revenue.

Formation of Fuel Reserves.

I am entirely in agreement with Mr. M. N. Krishna Rao, in his recommendations regarding the urged necessity for planting fuel reserves. Mysore is unfortunately situated in respect to supply of coal. But in the past, casuarina plantations have proved a fairly convenient substitute. The general introduction of electric energy seems to have a blighting influence upon private enterprises in this direction. The Forest Department do not appear to have any data regarding the annual increment for casuarina plantations and it is therefore impossible to frame any estimates of the financial results likely to be obtained from fuel plantations. Years ago, I had to consider the question in connection with the fuel supply of the Sandalwood Oil Factories, and it might be well to ascertain if the results of those enquiries have been preserved. The general impression left on my mind is that the inquiries showed that the growing of casuarina is fairly a lucrative proposition. If the timber can be grown, as I

believe it can at a cost which will easily enable it to compete with imported coal, there is no reason why extensive plantations should not be established by the Forest Department. It is urgently necessary to do something in this direction. Otherwise, future industrial development will have to depend on coal carried by Railways from an average distance of 1,400 miles.

Bamboos for Paper Pulp.

The question of making paper from Bamboo pulp has been under investigation in this State ever since the formation of the Department of Industries. Mr. Raitt, the Bamboo Paper Pulp Expert was retained for a time to report on the matter. Mr. Raitt's report was favourable but it was subjected to very adverse criticism and the data he furnished were re-examined but before final conclusions were arrived at, the matter was dropped owing to flowering of the bamboos over the whole area from which supplies were to be obtained. The Conservator of Forests now informs me that within the area reserved for the Bhadravati Iron Works fuel supply, there are vast number of bamboos which can be conveyed by the light railways to a central depôt. He has, however, no data as to cost of delivering them in large quantities, but he is confident there would be no difficulty in transporting 15,000 tons a year, which I consider the minimum quantity on which it would be wise to start working.

Another proposal for a bamboo pulp mill in another part of the State has also been made but it appears to be of a less favourable character than that in the Bhadravati area. During the last two or three years, I have had to investigate several similar propositions in other parts of India and in consequence, I have acquired a considerable amount of information bearing on the possibilities of bamboo paper pulp. The conditions existing in the Mysore Forests are none too favourable and I am very doubtful if there are any propositions that could be made commercially successful. I can confidently state that there are in Mysore more promising outlets for industrial capital than offered by the manufacture of paper from bamboos.

Coffee Bank.

Mr. C. Ranganatha Rao Sahib, the Director of Industries, has placed before me a file of papers relating to the establishment of a Coffee Bank at Chikmagalur. In his No. Cl. 1703—27-28 of the 14th June 1928, he states that the coffee planters are enthusiastically in favour of such a Bank, that ten of the wealthier planters are each prepared to subscribe Rs. 25,000 provided the capital of the Bank is fixed at Rs. 10 lakhs and that Government support the venture by subscribing one-fourth of the capital and pay the establishment charges for one year. Apparently the Indian Coffee Planters are in a sad plight but nothing is said in any of the papers as to the causes for their unhappy condition. For some years past, coffee has been doing very well, the crops have been good and prices high. The owners of the larger estates, both Indian and European, are flourishing but the smaller men are all hopelessly in the hands of money-lenders and their condition daily grows worse. An average coffee crop on a well-managed estate averages from 16-20 maunds per acre while on the small plots of Indian Coffee growers, the yield is only 5 maunds per acre. This is admittedly due to bad cultivation and to the lack of application of manure. From an economic point of view, this state of affairs is to be deplored as it means that roughly half the coffee area of the state is only producing one-third the crop it might do and the monetary loss runs into tens of lakhs of rupees. Considerable finance is provided by the Bank of Mysore but its operations are of no benefit to the needy small planters. I suspect the larger planters would like to see another Bank established as they might then reasonably hope that the Bank of Mysore would be a little more lenient and would reduce its rates of interest.

The question that arises is—in what manner should the situation be met : is the proposed Coffee Bank likely to prove a satisfactory solution ? The Bank of Mysore already operates in the District and it must be presumed that it renders all the assistance it can safely offer towards the finance of Malnad crops. The Coffee Firms on the Coast go a step further, presumably because, they have a more intimate knowledge of the planters and are able to make legitimate profits by handling the crops of their customers. I do not think the proposed Coffee Bank would really function as a Bank. It is possible that the capital may be subscribed. It may be able to obtain local current accounts but anything in the way of deposits is improbable. In fact, I cannot conceive a more inappropriate remedy than that which has been put up to Government. The case is evidently one which should be dealt with by the Registrar of Co-operative Societies. The conditions may almost be described as ideal for the establishment of several really powerful Co-operative Credit Societies. It is needless to describe the functions and scope of these societies. The small planters are in a bad way, because they do not understand coffee planting. The establishment of an ordinary Bank and the supply of easy credit would only encourage their bad habits. The function of a Co-operative Credit Society is not only to provide cheaper credit but also to carry on business in such a way that each member of the society contributes something tending to raise the character of

all the other members. The members should have an intimate knowledge of one another's character and capcity for business and they should be able to judge whether loans will be beneficial or otherwise. A Coffee Bank will have to be run by an official, who will have little or no knowledge of coffee. If he was drawn from among the friends and relations of the directors or shareholders, he would be subject to influences which will militate against the safe working of such a Bank. Co-operative Societies provide safeguards and it would appear that in the area of Coffee planting, there are many public spirited citizens, who might render valuable assistance to their poorer brethren by lending a hand to start these Co-operative Credit Societies and by placing their experience at the disposal of the societies. I would, therefore, advise Government to reject the proposal to establish a Coffee Bank and as an alternative, to instruct the Registrar of Co-operative Societies to deal with the matter.

The Cardamom Association.

The Director of Industries has recommended Government to sanction a sum of Rs. 100 towards the pay of the Secretary of a Cardamom Association which it is proposed to establish at Saklespur. He has prepared an interesting account of the formation and working of such an Association among the growers of cardamom in Travancore and it is thought that a similar association in Mysore would be of a great benefit to the growers of cardamom. Practically, the proposal comes to this—that Trade Associations should be formed to obtain higher prices for cardamom and to eliminate, as far as possible, the middlemen who intervene between the growers and the main consuming market. I recognise the necessity for action on the part of the growers but it is not desirable for Government to make this grant. Cardamom growers are quite able to look after their own interests, as is exemplified in Travancore where they have established a flourishing association without any State aid. The people in Mysore are too apt to look to Government, not only for direction and guidance in initiating new movements, but also for financial assistance to carry them out. I think it is undesirable to encourage expectations of this kind. It is obvious that Government cannot in any way control the action of a Trade Association and from the outset it should be made to understand that it must rely on the support of the constituent members. The cardamom growers must manage their own affairs. There appears to be no adequate reason why they should be given any State assistance.

Sericulture and Silk.

In 1913, Sericulture was in a very depressed condition and the area under Mulberry was only about 25,000 acres. It is now said to be about 50,000 acres. If the area under cultivation may be taken as a fair criterion of the state of Sericulture, it is evident that in the last 16 years, great progress has been made. I have read a number of reports and have discussed Sericultural questions with Mr. N. Rama Rao and the Director of Industries and I am satisfied that the measures now being taken to improve the status of Sericulture are quite satisfactory and all that is required is an allotment of larger funds for the establishment of many new grainages and for the employment of more men to carry on educational and propaganda work. The extent to which Government can allot further funds is no doubt limited and it might be well to emphasize the necessity for a larger turnover by way of sales from the grainages. The total expenditure in this branch of the Department of Industries is over Rs. 80,000 whilst the receipts only amount to Rs. 11,000. This seems to me to be an unduly small proportion. I accept the statement as to the superior quality of the seed sent out from the grainages and I think that it should be possible to get a much higher price for it than has apparently been obtained. I am told that the Government seed, on account of its freedom from disease and because it is of a superiors train, yields the rearer a return of 50 per cent greater than the original country seed. This superior class of seed should, therefore, be worth a much higher price and every effort should be made to obtain it. So far as I can make out, only about 10 per cent of the silk produced in the State comes directly or indirectly from Government seed and it is desirable that the proportion should be increased rapidly. It is obvious that since Government cannot make very much larger allotments than it has done, the policy of the Department should be directed to putting the grainages on a self-supporting basis as early as possible. Only in this way will it be practicable to cover all parts of the State in which silk cultivation is carried on so as ultimately to supply seed for the whole crop.

The second stage in producing market for silk is reeling. The country methods are crude and inefficient and do not do justice to the high quality of the Mysore silk. Much work has been done in recent years to improve silk reeling and the results achieved are of a very promising character. At one time or another, I have seen most of the new Filatures which have been started and and I do think it is necessary for me to give any detailed account of them. The silk now being reeled is of an excellent quality and will compare favourably with other sources of supply. Before reeled silk goes to the weaver,

it has to undergo further preparatory processes and it is satisfactory to record that in small factories, silk throwing and twisting, have been established and are doing excellent work.

The annual production of silk in the Mysore State is estimated at roughly 800,000 pounds of which, it is said, that 30 per cent is consumed by the weavers of the State and the balance is exported, chiefly to the weaving towns in southern India. Most of this silk, practically all of it, goes out as reeled silk. The ultimate aim of the Department of Industries should be to ensure that the whole of the Mysore silk crop goes out of the State in the form of fabrics, and from the progress made in this direction during the last few years, there is a very reasonable prospect of achieving this object. In Bangalore City, I have inspected some of the small scale powerloom factories in which a good deal of silk-weaving is done. I have also seen the silk throwing and twisting mill and I have asked some of the leading merchants what they think of the possibilities of further development. I must confess that I am rather surprised at the degree of enthusiasm they have displayed and the generous way in which they have recognised the value of the efforts of Government to improve the silk industry. In my note on handloom weaving, I have suggested a policy of co-operation with the merchants and the moneyed people who control the business side of the industry. In connection with these silk enquiries, further evidence has accumulated which demonstrates the advantages to be derived from an active policy of co-operation. I think the Director of Industries fully recognises this and the merchants are alive to the fact that Government can render them considerable assistance.

My recommendations regarding the immediate future developments hardly extend beyond agreeing with the proposals, which the Director of Industries has placed before me, some of which have already been sanctioned by Government and others are being prepared for submission.

In Mysore, there is a Filature which has been working for some years containing 12 basins and to this, 10 more have recently been added, but have not yet started work. In a few months' time, the reelers required for these basins will have become experts and it will then be desirable to add further basins and take on more reeling pupils till at least 50 basins have been installed. Estimates have been placed before me by the Director of Industries regarding the cost of working the Filature. But as they are all based on the purchase of cocoons at certain prices, and the sale of reeled silk at certain other prices, I really do not think they are of much use as a guide to what annual expenditure will be involved. If the Filature is to turn out good work, skilled superintendence is necessary and the larger the number of basins over which this can be spread, the smaller will be the cost of the overhead charges per unit of output. The criterion, as to the size of the Filature, should be the number of basins that one Superintendent can properly control, having regard to the fact that a good deal of training work must necessarily be carried on and that for some years to come, apprentices learning reeling will bulk largely amongst the staff. Ultimately, the Government Filature must run as a commercial proposition, but before that stage is reached, it will pass through a period of deficits due to cost of training work.

The number of private filatures which have been established so far is comparatively small; but I understand that they are earning profits, and I think these profits will increase, if adequate steps are taken to encourage the movement in favour of the use of Filature silk in the weaving establishments in the State. My first proposal, therefore, is that the Mysore Filature should be extended ten basins at a time till the number reaches 50, and then it will be useful to consider whether the number should be further increased in Mysore, or whether additional Filatures should be established in some of the larger silk-weaving centres. Encouragement should, of course, be given to private individuals to start this business on their own account. Experience would seem to show that the domestic basin designed by Mr. Rama Rao in groups of five may be recommended. It is undesirable to encourage private enterprises to start on too large a scale. As the training of the silk reelers takes time, it is necessary to maintain a high standard of quality in silk reeling, rather than to rapidly change over from ancient to modern methods of reeling.

The value of the imports of silk goods into India amounts to a very large sum and I have no doubt that most of these goods can be produced in Mysore, if the necessary steps are taken to improve the technique of the local weavers.

Recently, I inspected the Government Weaving Factory or Institute at Bangalore. There I found a number of old powerlooms, which might be relegated to the scrap heap as having served their useful life, and in their place should be installed the very best type of power-loom that can be obtained. The Director of Industries showed me the estimates which he has obtained for such looms and he also showed me some pieces of silk fabrics woven on such looms with Mysore silk. The quality of the goods was endorsed by all local dealers and with absolute unanimity, they stated that it would be perfectly easy to find a market for a very large output of such silks. I have, therefore, no hesitation in recommending that the proposals of the Director of Industries for the establishment of new silk looms

should be sanctioned. The complete equipment may cost about a lakh of rupees, providing for 10 looms capable of manufacturing at least 100 yards of silk goods per day of a value of between Rs. 3 and 4 per yard. This means that the yearly turnover will be about a lakh of rupees. It is perhaps rather small to carry the overhead charges which will necessarily be incurred. Everybody interested in the textile trades in Bangalore seems to think that Government should do something in this direction. I think it is a remarkable attribute to the success of the Department of Industries that so much interest is evidenced by these shrewd traders. I am averse from heroic measures and therefore do not recommend Government to incur a very large capital outlay. Rather, it will be wise to expect a small loss at the outset and to regard such expenditure as a grant-in-aid to an indigenous industry.

In connection with the purchase of these looms, it is essential that a skilled mechanist should come out with them, on an agreement for a year or two, to demonstrate what can be done with such looms and to teach weavers how to do it.

An important factor in connection with the silk industry and also to a lesser extent in connection with the cotton industry is that an effort must be made to secure a flow of new and suitable designs. In hand-woven goods, such as sarees, designs are more or less stereotyped. But in other directions, variety is demanded and an attractive design leads to a larger demand. I believe that the larger piece-goods dealers keep in their employ, men capable of furnishing designs for printed goods and these designs are sent home to be reproduced. Fashion plays a very important part in the success of designs and sometimes, atrocious productions from an artistic point of view have proved commercially successful. The Art Schools of India have not taken any steps to train textile designers. But it is possible there are a certain number of people in this country who have a natural talent for such work. To ascertain what the local resources are in this direction, I suggest offering prizes in a public competition for suitable designs. The organisation of such a competition will not be a very simple matter, and a good deal of enquiry will have to be made before the terms of the competition can be drafted. The Principals of the Schools of Arts in India might be consulted, as also some of the leading firms which are doing piece-goods trade. It is possible that the latter may be opposed to such a competition. Whilst there is a moderate degree of stability in pattern and designs associated with the cotton trade, it is necessary to recognise at the outset that with silk goods, patterns have but a short life and the manufacturers must be so organised that they can turn out orders by a given date. Fashion dominates the trade and none need try to cater for it who are not prepared to deliver punctually and ready to meet extraordinary demands.

A College of Engineering and Technology.

Before discussing the proposals submitted by Sir M. Visvesvaraya in his Note dated the 2nd December 1927, I should like to state that I am in entire sympathy with his aspirations for the development of the Mysore State and the enhancement of the income of the average citizen. It is sixteen years since, under his direction, Mysore embarked upon a very active policy of industrialisation and to-day, we are able to estimate roughly the results which have been achieved and so gather some data from the experience of the past as to the nature of the efforts which should be made in the future to carry on the work which he had so large a share in initiating. After spending several weeks in making a personal examination of the industrial operations now being carried on, I have no hesitation in saying that the outstanding feature is the growth of small power industries dependent for power on the very considerable network of transmission lines radiating from the Sivasamudram Hydro-electric station. In another note, I have dealt with this special feature of industrial life in the Mysore State, but I think I may here appropriately mention that the expansion of this great work of electrifying Mysore is in the main due to the courage and skill with which, when he was the Chief Engineer in Mysore, Sir M. Visvesvaraya tackled the question of creating a great storage reservoir on the Cauvery and became responsible for the construction of the Kannambadi Dam, which to-day is a noble monument of the professional ability and enterprise of the Mysore Public Works Department.

I imagine, however, that Sir M. Visvesvaraya is far from satisfied with the progress that has been made and there is ample evidence to-day of his zeal and disinterestedness in forwarding the material progress of his own country which should be a valuable example and guide to the younger men who are endeavouring to follow in his footsteps. Any proposals, therefore, which he puts forward are entitled to the utmost consideration and I feel sure that he will rejoice if they are subjected to as critical review as circumstances permit.

The scheme is a modest one involving only a capital expenditure of one and a half lakhs and a recurring expenditure of Rs. 75,000. Briefly it is to add two new departments to the existing College of Engineering to supply courses of training in (1) Industrial Engineering, and (2) Applied Chemistry. In these courses, to use his own words, "Attention is concentrated on

the training of top men and super top men because such training is the greatest need of the times, there being no provision in the Universities of India for the highest technological training obtainable in Western countries." By "Top" and "Super top" men, I understand, are meant persons destined to become managers of industrial establishments and those of a still higher grade who are sometimes popularly designated "Captains of Industry." In respect to industrial engineering, detailed information is supplied as to the kind of instruction to be given and I again quote from the note: "Under this head will come instruction and research in the highest branches of machine design, tool work, design and lay-out of industrial plant, power plants, factory management, technical and financial analysis of industrial plants, etc. In the same course, students would be given opportunities to acquire practice and specialise in one or more branches of engineering industries. Training should be given in the principles and technique of modern industrial production. Among these, Textile Engineering should be given special prominence. Other special subjects chosen may be locomotive engineering, automotive engineering and internal combustion engines, etc."

It is suggested that the staff to carry on this work should consist of a Professor, an Assistant Professor and two or three Readers and it is estimated that the salaries of this will be about Rs. 2,200 a month.

In regard to Applied Chemistry Department, a similar staff is suggested but there is less information in detail about the training which is merely described as "In Chemical Engineering" and in one or more of the following list of practical courses:—

1. Dyeing and bleaching and hand-printing of fabrics.
2. Leather tanning processes.
3. Soap Manufacture.
4. Chemical processes connected with mining and the manufature of iron and steel.
5. Wood distillation.
6. Pulp and paper.
7. Manufacture of chemicals.
8. Sugar manufacture.
9. Electro-chemistry.

Finally, "Lectures should be given for three or four hours every week to students in all the five courses of engineering and technology, on modern methods of business organisation, factory management and industrial concerns."

The concrete proposals to realise this scheme are additions to the Engineering College to cost half a lakh and equipment to cost one lakh of rupees. Textile Engineering is to be accommodated, with slight additions and alterations in the Government Weaving Factory, which is in the main devoted at the present time to the training of handloom weavers and possesses in addition half-a-dozen powerlooms, which I have elsewhere recommended should be relegated to the scrap heap. It is recognised that the electrical equipment of the College is defective and "it is hoped that an arrangement can be come to with the Indian Institute of Science to utilise the excellent laboratory and equipment of that Institute and thus save or postpone for a time further expenditure under this head."

This is the only reference made in the Note to the Indian Institute of Science although it has special departments devoted to research work in Applied Chemistry in three branches, Inorganic, Organic and Bio-Chemistry. I cannot help thinking that Sir M. Visvesvaraya has not formed an adequate conception of the extent to which that Institute could assist the Mysore State in providing training for the comparatively small number of students, who, for many years to come, are likely to need technological training of an advanced character. Fully thirty lakhs of rupees have been spent on the buildings and equipment and there is a constant demand for more money from the staff to keep the equipment up-to-date. In this connection, I have learnt that in the Electrical Department alone a further three lakhs of rupees is required for what are termed obvious necessities. Yet the proposals which we have now under consideration are only to cost 1½ lakhs at the outset and ¾ of a lakh a year afterwards.

I can hardly imagine that the terms "top and super-top men" connote anything less than the average research students of the Indian Institute of Science and I, therefore, am driven to the conclusion that Sir M. Visvesvaraya has greatly underestimated the cost of the training which he would like to see established. I do not know where the staff required to deal with the syllabus set forth for "Industrial Engineering" could be obtained. Certainly, there is no man in India capable of dealing with it and if there were, he certainly would not accept remuneration at the rate of about Rs. 1,000 a month.

Modern experience of what is termed by Sir M. Visvesvaraya "Applied Chemistry" is to the effect that the men who rise to eminence in whatever sphere of industrial activity do not and cannot acquire this special knowledge anywhere but in works and that College courses of training cannot be specialised to the degree necessary to render them useful. As is well known to the Mysore Government, I have in the past been engaged on their behalf in industrial

work of this character and though I have found the laboratories of the Indian Institute of Science and still more, their expert staff, very useful in developing new industrial ideas, at the same time the final results could only be obtained in the actual workshops that were established as the result of the preliminary investigations. I submit, therefore, that an Applied Chemistry Department will not achieve the ends sought for and that the only course to pursue is that by which we have already obtained not insignificant results.

Beyond stating that I consider that the proposals are sadly inadequate to meet the conditions prescribed, I feel that no useful purpose would be served in making a detailed examination of them. I would prefer rather to base my objections to the proposed Technological Institute on other and more general grounds. In the first place, I see no future in Mysore for great industries on account of its geographical position and its limited mineral resources, particularly the absence of coal. It is an agricultural State and as such, possesses great potentialities to which its provision for irrigation and hydro-electric generation and transmission of energy give it unquestionable advantages. It may and almost certainly will become the land of small industrial enterprise and it may become pre-eminent in silk and sugar production. Whilst entirely barred by transport charges from embarking in heavy industries, there is no reason why its mills and factories should not produce valuable light goods in which export will not be seriously affected by freight charges. It may well develop mechanical and electrical engineering and manufacture, to supply most of its own requirements and those of its contiguous neighbours. There is a fair prospect of its becoming a comparatively self-contained State, producing within its own borders a large part of its needs by the creation of skilled craftsmanship.

I have reason to think that Sir M. Visvesvaraya recognises the lack of what may vaguely be termed "An Industrial Atmosphere" in the State and that the students who attend the Engineering College have little or no conception of the fields of enterprise which would be opened out to them if they could obtain some idea of the achievements of industry, of the complexity of its organisation, of the interdependence of one branch of manufacture on another. Life in the Mysore State is all too simple to excite the imagination, and having little on which to exercise itself, infertility and stagnation are the natural result. Yet there is a good deal going on in the State which few know of except in a vague way and still fewer take the least interest in. The "Applied Chemistry" Department is a method by which he hopes to create new visions of industrial activity which will engender aspirations to take part in such ventures. The "Industrial Engineering" Department is but a development of the present teaching of mechanical engineering and I would strongly support such additions to the staff of the College and the installation of such machinery and plant as are calculated to improve the courses of instruction and extend their scope for the elite of the students. He remarks with great truth, "Industry, it is now recognised, has become more and more dependent on, and muted to, the Science of Engineering. In whichever country things scientific and mechanical are held in high esteem, it will be found that that country is on the high road to prosperity," and I am at one with him in recommending measures to improve the training of Mechanical Engineers.

What I think would for the present be a more useful way of putting the students into touch with the realities of industry would be the organisation of special courses of lectures by such experts as are engaged in the State in directing modern industrial enterprises.

Metallurgy and Mining have eminent representatives on the Gold Fields, at the Iron Works and the Manganese Mines; the officers of the Mysore Railways have experience in every branch of railway construction work and in the administration of open lines; the textile trades are well developed even if the number of mills is not large; hydro-electric engineering and electrical distribution of power and light have made great progress here, the Public Works Department has officers with varied experience extending from constructing a dam across the Cauvery, tunnelling through the hills, or supplying Bangalore with water, to building a palace in Mysore; the Director of Sandal Oil Factories and his Chemists control probably the largest distilleries of any single essential oil in the world; the Director of Industries has a varied knowledge of miscellaneous industries and an extended acquaintance with the economic conditions of the State; there are private individuals who have great practical experience in oil milling, flour milling, cotton ginning and the manufacture of jaggery. There is, therefore, a good deal of modern expert technical experience available, to say nothing of the scientific staffs working at the Indian Institute of Science and employed in the Mysore Educational Service. It should be possible to get some or all of these people in turn to lecture at the Engineering College. Such work is well worth paying for and a very high standard should be expected. The lectures should not be dull papers but fully illustrated by slides, diagrams, models and experiments and there should be no hesitation in bringing forward to the utmost extent possible the lecturer's own theories, beliefs and experience. The more the personal touch is evident, the more likely are they to excite human interest. One lecture a week of this kind followed by visits to the works which are the subject of the lecture would be of great benefit to intelligent students and would

certainly serve to awaken their interest in the wider aspects of modern production. It would greatly aid in getting such lectures prepared if a small staff were maintained to assist the lecturers in all the preliminary work of making drawings, diagrams, slides, etc. Rupees twenty thousand a year as remuneration for, say, 40 lectures would be money well spent and would, I think, yield more valuable results than the proposal to establish a chair of superficial technology. Incidentally, I think that the men called upon to lecture, and compelled, by the payment to them of liberal fees, to give good value for the money would be benefited not a little by the compulsory examination of the principles underlying their practice which would necessarily occur. It is true that it is not every practical man who has the gift of putting his ideas clearly and succinctly before so critical an audience as intelligent students can be, but it is also fairly certain that there are some whose talents in this direction have not yet been brought to the light of the day.

As to the part which the Indian Institute of Science can play in the intellectual development of the Mysore State, it would be better to discuss what can be done with the Director and his staff than that I should attempt even briefly to indicate my ideas which naturally follow my own personal proclivities.

The Application of Electrical Energy to Well Irrigation.

The only section of the work of the electrical department that I have thought came within the scope of the inquiries delegated to me by Government is that which pertains to the distribution of power in rural areas. This is at present chiefly employed to drive small motors and pumps, of which about 70 have so far been installed. There is great scope for work in this direction but if the best results are to be obtained, it will be necessary to supply Mr. Forbes with very capable assistants to study the whole question of well irrigation both as an engineering proposition to secure the most efficient plant to lift the water to the required level and as an agricultural problem to secure the maximum duty of water and the greatest value of crop from the land irrigated.

Mr. Forbes has probably quite rightly selected a standard combination of motor and pump of small capacity suited to the average yield of water from existing wells. I think I am right in stating that the normal set he now installs is designed to lift 2,000 gallons per hour to a height of 60 feet using a 2″ suction pipe and 1½″ delivery pipe; further this set works under these conditions with an efficiency over all of 40 per cent which is a satisfactory figure. But it is necessary to point out that this efficiency is only realised at the full head and that at lower heads, it rapidly falls over. Working on a head of 30 feet, the discharge may rise to 2,300 gallons per hour but the power used will be the same and the efficiency, only 23 per cent. Whilst on a 25 feet head, it may fall as low as 20 per cent in which case the cost of lifting water even at the low rate of 1½ annas per unit works out at a rather high figure.

Electrical pumping is by far the most convenient method of lifting water and at the rates charged for energy in Mysore, it is also the cheapest, but only when the pump is suited to the work. A standard set cannot give the best results in all and probably not even in the majority of cases and it is therefore desirable to consider each application of electrical energy to lifting water as one which has to be treated on its own merits. I merely wish to emphasise this point because, whilst in a factory of any kind, the cost of motive power bears but a small ratio to the cost of all the other items which are involved in a manufacturing process, in the case of lift irrigation, it is the whole cost and even if one considers the ratio which it bears to the cost of cultivation, it is always very high. It is therefore very important that each installation should be designed to secure as nearly as possible the maximum efficiency. Forty per cent is a good figure for the small plants which have so far been put down but with larger water supplies, efficiencies ranging from 50—70 per cent should be obtained. I need not go into engineering details as to how these results can be realised as the electrical department is quite competent to deal with the problems which will arise. It will however add largely to the work and something also to the initial cost of installations but in the long run, such expenditure of skill and money will be well repaid.

The raiyat or cultivator needs a great deal of help when he goes in for mechanical methods of lifting water. The water flows so easily from the pipe that he is inclined to waste it, his channels are very crude and conduct the water to the spot where it is to be used with considerable loss by seepage and he should be encouraged to construct, as far as he can, permanent masonry channels distributing the water from them by U-shaped troughs which can be made of earthenware like Mangalore Tiles. It might be advantageous to direct the attention of the numerous tile factories now in the State, to the urgent necessity that they should produce a cheap and serviceable trough for irrigation channels.

The cultivator generally, but not always, from practical experience has a fair idea of the capacity of his well and he knows to what extent it can be depended on at the end of the hot weather and how long it will take to fill up again. He has seldom any idea as to the increase

in yield that may be obtained either by deeper excavation or by pulling in from the bottom a bore hole and then exploding at the bottom of the bore hole a considerable charge of dynamite. This operation is known as "Torpedoing" and frequently produces a very material increase in the flow of water. Most Mysore wells except in alluvial flats derive this water from springs or fissures and it is simply a matter of luck striking a really good fissure. Where it is possible, records of each well should be maintained in the form of number of hours the pump has worked and the average discharge, level of water at the start and at the finish with a note as to whether the level remains constant for any length of time. Such records will yield useful information as to the prospects of getting more water by deepening the well. In cases where as in disintegrated rock, there is considerable percolation from the sides, horizontal actils run from the bottom of the well may be useful. To deal with these questions requires experience which can only be gained by prolonged observations and it is desirable that the staff of the Department should have time to give to such work and that they should be sufficiently intelligent to draw correct deductions from the data they accumulate. My experience in the Madras Presidency where I was responsible for the installation of nearly 1,000 engines and pumps was to the effect that service officers should not only be competent to do the engineering work required of them but that they should also possess a fair all round knowledge of agricultural practice so as to be able to discuss agricultural questions with pump owners and give them advice. Intelligent, well-trained young engineers find no difficulty in picking up the practical information of the kind needed as they are always out in the field and come in contact with every kind of cultivation at every stage in its course. A preliminary training on an agricultural farm is of advantage but is by no means essential. To a large extent, I attribute the extremely slow progress of mechanical pumping to neglect to maintain in a very high state of efficiency the service system without which the raiyat is very helpless.

The Bhadravati Iron Works.

I visited Bhadravati on the 19th—21st March 1929, saw the working of the whole plant and discussed the present situation with the senior staff. In considering the future policy to be adopted, it is only necessary to go back to the time when a Committee of Management was appointed with Sir M. Visvesvaraya as Chairman. Under their advice, new estimates, to extend the scope and improve the working of the plant, amounting in all to Rs. 22 lakhs, have been sanctioned. Of this amount, however, only 12 lakhs have been spent as the reconstruction and enlargement of the Pipe Foundry has not yet been started. Advantage was taken, at the time when it became necessary to reline the blast furnace, to enlarge its capacity from 60 to 80 tons of pig iron per day and this involved increasing the number of charcoal retorts from 12 to 16. The still house as orginally installed was 50 per cent larger than required for the quantity of pyroligneous liquor produced and the enlargement of the capacity of the retorts and furnace enables a more efficient utilisation of this plant. At the outset only crude alcohol was produced and Rs. 3 lakhs have been spent on plant to produce refined products which are readily sold though at prices which can hardly be considered remunerative. Similarly the crude tar is now refined and yields products which are more readily saleable. The Forest Department have installed alongside a wood Creosoting plant which utilises the Creosote from the tar distillation and enables them to place on the market railway sleepers from timber otherwise unsuited for such a purpose. So far, it may be said that the fresh expenditure has justified itself and contributed to the development of the works.

The difficulty experienced in selling the pig iron suggested the establishment of a pipe foundry and 4½ lakhs were sanctioned. The turn table was constructed for 9" pipes and was modified to deal with pipes up to 16" diameter. This has not proved satisfactory, nor has the general lay out, and to remedy defects and increase the capacity of the fundry and enable it to deal with pipes up to 30" diameter, a second estimate amounting to 10 lakhs has been sanctioned. Whether this will prove a remunerative investment will depend on the quality of the work turned out and upon the extent to which orders are obtained. If successful in both these directions, the Iron Works should be able to dispose of all their output and should be able to earn a small profit. At the present moment, the Iron Works are carrying a stock of from 18-20 thousand tons of pig iron, for a large proportion of which, there is little or no demand, whilst the pipe foundry has over 2,500 tons of pipe in stock, a large proportion of which is of inferior quality. Should the anticipations regarding this venture not be realised, the last hope for the works is in the manufacture of Steel of which about 20,000 tons a year could be turned out and for which there should be no difficulty in finding a market. Very elaborate inquiries are now in progress regarding steel production and the latest conclusion is to use a duplex process—the pig iron from the foundry being first treated in a Bessemer Converter and the final product prepared in electrically heated furnaces. The plant for steel making will cost a lot of money as it will also be necessary to set up a suitable rolling mill. Apparently without hydro-electric power, the scheme is impracticable

and power must be obtained either by an extension of the Sivasamudram system to Bhadravati or by the utilisation of the Jog Falls. Either alternative is a costly one but it would only be possible to express an opinion on its feasibility when the estimated cost of the whole scheme is worked out. A subsidiary proposal to create a demand for electric energy if the Jog Falls were utilised and to make better use of the system of tram lines which has already been constructed to bring wood from the forests is the establishment of a paper mill at Bhadravati using bamboo as the raw material. I do not think the Government of Mysore would be justified in embarking on this enterprise but it is possible that private capital would be attracted if the Government were prepared (1) to guarantee the delivery at Bhadravati of 15—20 thousand tons of bamboo per annum at a fixed price per ton and (2) were equally prepared to supply electric energy at a fixed rate per unit both for power and light and at a much lower rate for steam raising. In this way, the disadvantages of the site for a paper mill would be minimised and the already existing facilities of large stocks of bamboos and an excellent system of transport would be brought into use. There are other minor developments possible, each small in itself but all contributing to the creation of a permanent industrial centre. The establishment of steel making, I am regretfully compelled to regard, as a somewhat remote possibility on account of the power question and I think the best policy in the immediate future is to concentrate on making the foundry a success and to some extent, this will be aided by anything that contributes to the general development of the State.

The manufacture of acetate of lime in India was regarded as of sufficient importance during the war for the British Government to spend over £ 400,000 on a futile attempt at Nasik and the wood distillation plant at Bhadravati may be regarded as a military asset of some value and one in which the Army Department of the Government of India ought to be keenly interested. By using Methyl Alcohol as a denaturant instead of Caoutchosine and Pyridene, the Government of India would create a better market for the methanol products, which would, to some slight extent, help the situation at Bhadravati; and by encouraging the use of the charcoal pig iron in the Engineering Works under its control, it could easily render assistance that would ensure the future permanence of wood distillation. It is, I consider, not unfair to compare the Bhadravati Iron Works with the Tata effort at Jamshedpur, though the scale of operation is vastly different. The latter are regarded as of such national importance that they have been granted large bounties for a time and even now are kept in operation by protective duties of a formidable character. In its way, the wood distillation is of national importance and now that it has been established in India, it should certainly not be allowed to die out. It is quite certain that if another war occurred, the Government of India would request the Government of Mysore to place this wood distillation plant at their disposal for the time being. It is therefore not unreasonable to expect some measure of support in peace time and if that can be effected by adjustments in the administration of the excise and of the engineering factories at practically no cost, it should, I think, be indicated to the Government of India that some help of this kind would be appreciated.

Although I have stated that I regard the electrification of the Bhadravati Works as a somewhat remote event, it is nevertheless a project which should be thoroughly investigated. I do not favour extending the lines from Sivasamudram to Bhadravati as that source of electric energy will ultimately be required to supply demands for power within the area now commanded. Nor do I favour a partial utilisation of the power which can be made available at the Jog. The construction of the largest reservoir feasible should be undertaken at the outset even though the hydro-electric plant to fully utilise the supply of water is not installed. The electrical production of steel should not be undertaken without consultation with the Government of India as to the future needs of the country. Bhadravati with electric furnaces can undoubtedly supply special qualities of steel which cannot be easily made in the North of India at either of the existing Iron Works. For the Ordinance Department and for the Railway Workshops special steels are required and it should be ascertained beforehand what they are and the probable demand for each kind. If the manufacture of these special grades proves to be possible, with an assurance that these products will be taken over by the Government of India to the extent they can be used, there will be a greater measure of certainty that capital invested in the manufacture of steel will be profitably employed.

As is perhaps known to Government, I was opposed to this scheme when it was first under consideration but now that it is *un fait accompli*, I am keenly interested in not merely keeping it going out, like the Chairman of the Board of Management, in making it an important factor in the material progress of the State. I have been profoundly impressed by the results already achieved under great difficulties and I admire the spirit in which the whole staff are working. The organisation that has been created is an indication of what can be done in the State and justifies my recommendation that an even greater venture in State socialism should be undertaken in connection with the irrigation from the Cauvery Reservoir. It is the judicious intermingling of private effort with State-controlled enterprise that will bring about a very great increase in the material prosperity of the country.

Acetone is a solvent of both Nitro-glycerine and Nitro-cellulose and as such is essential in the manufacture of Cordite. It is usually prepared from Acetate of Lime which is a product from wood distillation. To obtain adequate supplies of Acetone during the war was a matter of great difficulty to the Allies and various processes of manufacture were established, on a large scale. The British Military Authorities erected a factory at Nasik at a cost of about £ 400,000 to prepare Acetone by a fomentation process, but the factory was only completed after the Armistice and after a few experiments, which indicated that the process was likely to prove a costly one, it was shut down and eventually disposed of to the Bombay Government. So long as Cordite is used, Acetone will be required. It is therefore a prime military necessity since the continuous working of the Cordite factory at Aruvankad depends upon its being available and it is understood that a complete plant has been installed there for the preparation of Acetone from Acetate of Lime.

In recent years and since the War, the Government of His Highness the Maharaja of Mysore have established what is believed to be the largest wood distillation plant in the world in order to obtain charcoal for the manufacture of iron and steel. The Bhadravati Iron Works and the wood distillation plant now handle 120,000 tons of wood per annum, from which is obtained over 1,500 tons of Acetate of Lime and about 150,000 gallons of methyl alcohol, besides other bye-products of some commercial value. The charcoal is capable of smelting 28,000 tons of high grade cast iron.

Owing largely to the prolonged depression in trade and commerce, which is one of the consequences of the economic disturbances set up by the War, the Mysore Government have not been able to realise the anticipations with which they entered upon this industrial undertaking. For about seven years, they have carried on at a very considerable loss and have arrived at the stage when expenditure and revenue just balance. Hitherto it has not been possible to provide for the inevitable depreciation of the plant and further capital outlay is required to provide for logical developments. Having regard to the fact that the wood distillation section possesses some value as a military asset in time of War and that the abandonment of the enterprise would weaken the position of the Cordite factory, it seems not unreasonable to ask the Government of India to accord some measure of assistance in the disposal of the products. Fortunately, there is no difficulty in getting rid of all the acetate of lime in peace time and it is also recognised that in time of war, the outturn would be commandeered. At the same time, it would only be fair that the Ordinance Department in peace time should obtain all and not merely a part of their requirements from Bhadravati paying only the normal market prices. Equally the whole of the methyl alcohol is easily sold abroad but in this case the cost of transport seriously reduces the return and it is suggested that considerable assistance could be rendered by using the methyl alcohol as a denaturant in place of pyridene and caoutchocine. For industrial alcohol, the return to methylated spirits would be welcomed throughout India and from an excise point of view, a denaturant, which is accepted throughout the British Isles, might be regarded as suitable for India. Lastly, there remains the question of disposing of the output of pig iron which, being made with charcoal, is of very fine quality. The metallurgical treatment of this material has been the subject of very costly investigations and experiments and the time has now been reached when it is necessary for the Mysore Government to take important measures to obtain a more valuable product from the charcoal iron. They contemplate setting up electrically heated furnaces for the production of special high grade steels but without some assured support from British India, it is felt that the commercial risks are possibly more than the State would feel justified in incurring. Venturing to regard the wood distillation plant as an Imperial asset, the Government of His Highness the Maharaja of Mysore consider they are justified in asking the Government of India to examine the position with a view to ensuring the permanent working of the enterprise.

Arts and Crafts in Mysore.

The Chamarajendra Technical Institute in Mysore and the Art Workshop in Bangalore are the two institutions in the State in which some attempt is made to train art craftsmen. It cannot, however, be said that the efforts so far have met with any marked success. As Industrial schools training artisans, they are doing useful work and providing a certain number of boys with opportunities to learn trades by which they can afterwards earn a fair livelihood. Such work might be better done if the instructors were more capable and if an incentive existed to turn out better work in the shape of an insistant demand for it. It may be assumed that the results are good enough and that the quality of the work of the artisans satisfies a market the requirements of which are dominated by restricted purses. I do not therefore propose to criticise these institutions as Industrial Schools but instead to briefly consider what steps should be taken, if any, to improve what may be termed art craftsmanship. The Gudigars, whose skill in sandalwood carving is well known, are possibly the most artistic craftsmen in the Mysore State, followed at a great distance by a few ivory inlay

workers. There are some metal workers of an inferior grade but whether they belong to the indigenous population or have settled here, I do not know. The remains of old temples show that at various periods some kind of craftsmanship flourished, but it probably all disappeared during the Mahommedan domination save in respect to the provision of military needs. Mysore produced excellent wootz steel and its simblis and armourers enjoyed more than a local reputation. They made swords and spears, body armour and hunting knives and later, fowling pieces, smoke bore guns and even rifles. The history of Mysore in the 19th Century was not favourable to artistic expression of any kind. The energies of the administration were confined to the repair of the ravages of the war and misgovernment, and it was only at the beginning of this century that efforts were first made to encourage and develop craftsmanship, when the building of the new Palace in Mysore offered an unusual opportunity. Unfortunately there has never been a qualified leader to direct efforts and no real progress will be made without one. That there is much latent craftsmanship in Mysore, I do not doubt, but it entirely lacks opportunities for development. The Education Department neglects this side of education, the University ignores it and the feeble efforts of the Department of Industries only serve to exhibit the state of decadence. I am not qualified to enlarge on this subject but I am sure that my advice is sound when I recommend that something should be done to remedy matters. The people of the State need to have their artistic faculties developed. I believe it would be money well spent to establish an Art Gallery and a Museum of Art Craftsmanship. Till the people see, and are taught to appreciate the visual contrast, the difference between gaudy meretriciousness and artistic simplicity in form and ornament, it is impossible to expect that their tastes will change or their instincts towards truth prevail. It is frequently asserted that modern education in India is in need of reform and I agree and I go further and suggest that the absence of art teaching is one and by no means one of the least defects that requires urgent attention. If the educative classes could draw, paint, model, sculpture, hammer metal and work in wood they would soon effect a mighty change in their environment. There would be less discontent and more employment occupation that was not mere drudgery to be submitted to as an alternative to starvation or poverty. Craftsmanship of every type would develop. This is, I believe, the most practical direction in which education can be reformed. It would give the rising generation, both male and female, a new outlook on life. It would teach them to observe and once trained observers, they would begin to think and with thought, would come new ideas. The co-ordination of hand and eye would create new powers which would soon find outlets for their exercise.

Hitherto, we have confined education to literary subjects and memory mainly has been developed and students' minds filled with half-digested ideas of other people. The result is visible to all and yet the Education system from the primary classes upwards has no goal other than to produce a mental congestion that paralyses the faculties. It is a surprising fact that more harm has not been done, but unfortunately there are more potent educative influences than our schools and colleges. The problem which faces us is an extraordinarily difficult one as the whole atmosphere is full of influences which bind us body and soul to the existing depressing routine. The cinema and the gramaphone are exerting a baneful influence and these products of a foreign civilisation and culture are calculated to enervate and destroy the moral fibre of their votaries. The call for vocational training is evidence of recognition that all is not well but it is no solution of the problem which confronts us. Reduced to its most naked aspect, it is really premature specialism and the nearer it approaches to realism the more intense will be the narrowness of the outlook which it will engender. Those who pay the piper will call the tune and I see but little hope of weaning parents and guardians from demanding education for their charges of the type they have received themselves.

I cannot make this note too long. The immediate motive which has caused me to put forward this denunciation of modern education is that I think it would be possible to raise the status of Arts and Crafts and make them part of the general system of education in, at first, a very limited number of schools. I do not see why the Chamarajendra Technical Institute should confine its work to the class that should benefit by it least. I do not want to touch the purely industrial side of it—that may continue—but I would like to see the young men and boys from the Colleges and High Schools of Mysore City given opportunities to work there and a day or two days in a week taken from their scholastic curriculum to put them in touch with solid realities. I am perfectly aware that it would interfere with their University studies and I would have it so. A University Degree has a steadily increasing value and its possessors are daily finding that, as a key to the opening of a career, it is only able to disclose vistas of blind alleys with no prospect but drudgery.

To put my recommendations shortly, I would abolish the Art Workshops in Bangalore—they are doing no good and the artisans who work there can be sent to Mysore to the Chamarajendra Technical Institute. They are mostly Gudigars and Ivory carvers and as such they are not permanent residents of Bangalore so that the change will cause them little or no inconvenience. This will effect a saving of about Rs. 1,000 a month which might well be devoted to improving the Mysore Institute. How that should be dealt with can be best

explained by setting forth what it ought to be. It should be the centre of the Art Life of the State, and at its head should be a man, Indian or European matters not in the least, who possessing the requisite training should be able to create an indigenous school of art, drawing its inspiration from Dravidian sources, modified and refined to bring it in harmony with modern needs and culture. It will require a genius to do this and such may not be found immediately. Art can only develop where there are patrons and undoubtedly the first work to be done is to purify the taste and exalt the ideas of the leaders of Mysore Society. The best man that can be obtained should be engaged and it is rather for him than for me to say how he will work to achieve the end in view.

For the encouragement of the Mysore Arts and Crafts, there is a Depôt on the South Parade maintained by Government for the sale of "Artware." I have recently visited it and I find that it has degenerated into an emporium of so-called art curios, in which goods received from any one who will send them are offered for sale. It was started in other premises 15 years ago with the idea that it would become a floating museum of the Arts and Crafts of Mysore where the craftsmen could exhibit their work and find appreciative patrons. It was hoped that gradually the standard of excellence would be raised and that influence could be brought to bear on the craftsmen to strive for quality rather than for quantity. No traces of this idea are to be found and the Mysore Government, in maintaining the Depôt, are merely acting as middlemen for the sale of Bazaar products. The Depôt requires complete re-organisation. The articles exhibited should be exclusively confined to producers in Mysore and, instead of being packed like dry goods in a store, arrangements should be made to exhibit them in suitable surroundings. The people in charge of the Depôt should have some knowledge of the exhibits and should be able to give information regarding them. Some discretion should be exercised as to the nature of the exhibits and the specimens exposed for sale should first be passed by a competent authority nominated by the Director of Industries. I am not in favour of the Director of Industries' scheme of making it a reciprocal repository of artware from all parts of India, by which I understand that goods are received here and exposed for sale from other Provinces on the understanding that they receive Mysore Goods and make efforts to sell them on similar terms. The Mysore Arts and Crafts Depôt should reflect the character of its people and it will earn distinction the more faithfully it represents their idiosyncracies. It is hardly likely to pay its expenses if worked on these lines, but it will possess an educational value and will show to the outside public the distinctive features of the Mysore Art. The range of craftsmanship is extremely limited and it is possible that the introduction of new forms would excite an interest in manual work which is at present too closely associated with the artisan classes.

The Manufacture of Caustic Soda and Bleaching Powder.

By the electrolysis of common salt, two final products can be obtained, *viz.*, Caustic Soda and Bleaching Powder. For the former, there is a market in Bangalore for soap making but there is no market for bleaching powder unless it is used by the Health Department for sterilisation of water. Bleaching powder is imported into India to the extent of about 5,000 tons a year and the Mysore production could be sent to Bombay for sale. There is, however, an element of doubt as to whether or not, with such lime as is available in Mysore, a marketable bleaching powder can be produced. I think not, and when it has also to be remembered that a small factory in Bangalore is entirely at the mercy of the heavy chemical traders, I unhesitatingly recommend that this scheme should not be proceeded with.

The Central Industrial Workshops.

These mechanical engineering workshops were originally started by the Public Works Department to supply its own needs and in 1917 were transferred to the control of the Director of Industries presumably with the idea that under that officer, they would be able to render useful service to the expanding industrialism of the State. There are also private workshops in Bangalore but their equipment is limited and they are not likely to develop in the presence of a Government-controlled Workshop. There used to be, and I presume still is, a grievance on the part of the privately-owned concerns that they suffered from unfair competition and as proof of it, they pointed to the fact that the State-managed institution was invariably run at a loss. The financial aspects are fairly dealt with in the "Note on Industrial Concerns under the Department of Industries" prepared by the Director at the end of last year. These workshops enjoy in certain respects a virtual monopoly consequent upon their geographical position and there can be no question of handing them over to private enterprise. Last year, the workshops attached to the Electrical Department and to the Military Department were abolished and their equipment taken over by the Central Workshops. The Director of Industries and the Chief Electrical Engineer have submitted proposals to Government for the control of the shops and the handling

of the Stores. No system of joint control seems admissible as it leads to inefficiency or friction and the responsibility for good management should be vested in the Department of Industries. Similarly, all special stores required by the Electrical Department should be held in the custody of that Department and issued to Works or to the Workshops under the orders of the Chief Electrical Engineer or the officer to whom such a duty is delegated. The Electrical Department is naturally more competent to maintain its own stores than any other authority and equally the cost of maintaining such stores should be regarded as a charge upon the Department. The question of computing the rates to be charged for work done for Government Departments has been the subject of controversy. Neglecting work done for private parties since Government maintain the workshops for their own convenience and not with the idea of making a profit, which will be merely obtained at the expense of each Department—it seems obvious that the work should be charged for at such rates as will actually cover the total cost and no more. The real difficulty is to determine what is a fair charge for any piece of work done. It is made up of the following items: (1) Raw materials—value of which can be easily ascertained, (2) Labour—equally easy to ascertain, (3) Supervision charges—very variable and smallest in repetition orders, (4) Rent of tools, plant and workshops—in which also may be included depreciation. This can be assessed by a time-charge for the use of tools and plant with a supercharge of a fixed percentage on labour and rent combined, (5) Overhead charges chiefly administrative in which should be included interest on capital invested in buildings, land and the cost of Direction—equivalent to the charges due to a Board of Directors in a private Concern. Every half year, the total of these charges can be calculated and the percentage ascertained on the value of the work done. At the present time, no definite rules are in force by which costs can be calculated and I suggest that some one with experience of "costing" should be deputed to draw up a suitable scheme which should be applied to all work turned out, whether for Government Departments or on private account. As the Workshops are maintained to enable the various Departments of the Administration to get their requirements made at the minimum cost, it is desirable that orders should be issued that all orders are to be placed with the Central Workshops. Outside work should not be sought but the facilities possessed by the Workshops should be at the disposal of the public on the same terms as Government Departments save that in order to prevent competition with privately-owned engineering establishments, an overhead charge of about 15-20 per cent should be added. This charge, however, should not be made on the standardised products of the Workshop about which I now propose to say something.

It is only by encouraging in a very marked way the use of improved implements and tools that cultivation can be improved and a local engineering industry built up. The Agricultural Department under Dr. Coleman has accumulated the necessary experience to justify the standardisation and at my request, he has furnished a note on the subject which I submit with the recommendation that steps be taken to manufacture the specified implements and that the existing facilities for the distribution of implements be utilised to the fullest extent possible and that it be expanded by the creation of new depôts in suitable centres. The finance of supply may be based both on taccavi loans and sales on the hire purchase system. Roughly about a million ploughs are in use in the Mysore State and with an average life of 5 years, there is a potential market for 2,00,000 ploughs a year and for about double that number of spare parts. The main advantage of iron ploughs is the lessened draft and consequently greater speed with which ploughing can be done. In years of uncertain rainfall, this is a matter of great importance.

The development of the Workshops to manufacture oil and gas engines, suction gas plants, power-driven cane mills, oil mills, centrifugal pumps, etc., must depend on the progress made by the Department of Industries in opening up a demand for this kind of plant. But still more, it will be accelerated if the proposals regarding the cultivation of sugar-cane under the High Level Channel from the Krishnarajasagara Tank are carried. Then there will be for a time a large demand for cane-crushing plant for which it is presumed, arrangements will be made to supply electric energy. As this scheme develops, it will certainly give rise to a demand for mechanical engineering which the Workshops should be prepared to meet. A Firm in Calcutta, Messrs. Bery and Company, turn out a considerable number of oil engines. They manufacture them from designs furnished by an English Firm and at the outset, I would recommend that in Bangalore, a somewhat similar procedure should be adopted. Only in this case, I would go further and get out from England all the steel work in a finished condition ready for erection and attachment to the cast iron work which would be done locally. If the proposal is approved, there are, I understand, firms of repute who will be willing to co-operate. By so working, a better class of engine or machine will be obtained at the outset and much capital outlay on special tools and jigs will be saved. Further, in the shortest possible time, the largest possible local market will be created for Mysore iron. In other parts of India, a good deal of this class of work is now done and if in Calcutta, a Sikh Firm can make oil engines and if in Madras, a British Firm can build excellent sugar mills, there seems to me to be no reason why here in Bangalore or at Bhadravati both classes of work should not be turned out. I

do not now go into details as to how this work should be taken up as the necessity for it only arises if Government are prepared to accept the general policy in regard to industrial and agricultural development which has been placed before them in other notes. The various schemes interlock to some extent one with the other and the greatest progress will be made if they are all regarded as parts of a general programme to be worked up in the next few years.

Sri Krishna Gold Thread Factory.

I paid a visit to this Factory in company of the Director of Industries. Most of the plant was not at work and I was not particularly impressed by the way in which things were being done. In ordinary circumstances, I should not recommend Government to have anything to do with the Factory. But it appears that advances were made to the extent of Rs. 25,000 and it is obvious they will be entirely lost unless some further effort is made to revive the industry. The Director of Industries has watched the working of this concern during the whole period he has been in his present appointment and he is of opinion that if he is placed in sole charge of the Factory, he will be able to make it turn a profitable venture. Satisfactory evidence was produced that gold lace could be made and that it can be made at a profit. Success or failure entirely depends upon the skill of the management. As the Director of Industries is of opinion that he can make a success of the Factory, I recommend that he should be allowed to take it over and run it for a time provided the proprietors of the Factory agree. The Director should be furnished with sufficient current finances to run the Factory, having full liberty at any time to close down operations and dispose off both the goods in stock and the plant.

The Indian Institute of Science.

I have received the attached memorandum from the Director of the Indian Institute of Science. The Director's attention has been drawn to the fact that for the academic appointments in the Mysore State, trained students of the Institute have been passed over in favour of young graduates who have no practical experience outside the College Laboratories in which they have acquired just enough practical experience to pass the University examinations. I am in entire agreement with the Director that the value of research training is very great and I think that no teaching posts should be filled by University graduates who have not had at least 3 years of experience in research work. Whether the ultimate aim be additions to scientific knowledge or whether it be directed to avowedly practical ends, in both cases, work of this kind tends to produce a mental development which greatly increases the capacity of the individual to deal with almost any kind of problem.

During the short time I have been investigating what is now being done to develop the Industrial resources of Mysore, I have been struck by the comparative failure to utilise the resources of the Institute. It will be remembered that the late Dewan, Sir Seshadri Iyer was so vastly impressed with the advantages that would accrue to Mysore from the location of the Institute within its territory that he offered substantial inducements to achieve that end. Between 1913 and 1917, there was fairly active co-operation between the Indian Institute of Science and the newly constituted department of Industries and investigations were undertaken in connection with the preparation of Sandalwood Oil, the manufacture of Soap, Wood Distillation, the Manufacture of White Lead and a number of other minor matters. Of late, so far as I can make out, the connection between Mysore and the Institute of Science is reduced to one student of the State working in the Research Laboratories. It has been brought to my notice by Mr. M. N. Krishna Rao that there are many Forest products, which, he thinks, should be carefully examined with a view to ascertain if any of them are of substantial commercial value. There are proposed developments in connection with the manufacture of Ghee substitute which may prove of great importance; but nothing can be done without adequate research and the preparation of final products on a semi-commercial scale, so as to furnish material for tests, the object of which is to ascertain whether products will be to the taste of the consumers.

In the Electrical Department especially in connection with the distribution of power for rural industries including raising water for irrigation purposes, there are numerous practical problems well suited for experimental work by students. Again, it is possible that the industrial future of Mysore may, to some extent, depend upon the development of Industries of the Electro-chemical or Electro-metallurgical type. Some work in this direction has already been started at the Bhadravati Iron Works. But the proper place for such research work is in the Indian Institute of Science. Yet, so far as I can make out, no attempt has been made to place these possibilities for future work before the controlling authorities of the Institute.

I think I am correct in saying that the technical experts at the Indian Institute of Science do not consider that it is for them to initiate research work in Industrial problems. Such work should be brought to them and if it is within their resources, they are anxious to

take it up. There is no doubt that the Mysore State is entitled to claim a large measure of assistance from the Institute and there is equally no doubt that the authorities of the Institute will welcome requests for assistance. In practice, however, these unrivalled opportunities are neglected, and if by drawing attention to this point I should succeed in changing the present attitude of comparative neglect, I am certain it will be of great advantage to the material prosperity of the country.

As a first step in this direction, I would suggest that selected students should be invited to undertake research work at the Indian Institute of Science in connection with the following problems:—

1. The manufacture of lamp black from the tar products of the Bhadravati Iron Works. This, I may mention, has already been taken up, but in a very half-hearted way;
2. Investigation of the Essential Oil yielding plants capable of growing in the State;
3. The study of problems connected with the use of electric energy which is now distributed over a wide area of rural tracts;
4. The study of the contemporary achievements in Electro-metallurgy and electrochemistry to ascertain what can be utilised to advantage in dealing with the resources of Mysore.

Lastly, the Institute might also be asked to investigate the prospects of utilising the energy of the wind for rural purposes, in areas where it is not possible to supply electric current. Compared with most parts of India, Mysore is favoured with fairly strong and steady winds.

These are a few suggestions which have occurred to me without any special opportunities to consider what action should be taken. I am certain that the administrative officers must frequently have their attention drawn to suitable subjects for research, but it is necessary that they should be trained to recognise them.

The Gangenhalli Fruit Farm.

On the 4th April 1929, I visited the Fruit Farm at Gangenhalli which has been established by Mr. Mc Isaac. I was very greatly surprised at the results which he has obtained in the course of the last ten years. Apples, Oranges, Citrus fruit, and Pine Apples were the principal products. Mr. Mc Isaac told me that if a sufficient water supply is available to fruit gardens, similar results can be obtained in many other areas round Bangalore. It appears to me that Fruit Gardens, with a water supply from wells, can certainly be established without difficulty if the men who start them are properly trained on the system worked out by Mr. Mc Isaac. Extraordinary figures were given to me by Mr. Mc Isaac regarding the value of the crops he has obtained and a very few acres of really good trees appear to be sufficient to yield a man a very comfortable living. I think it is hardly likely that the best commercial results will be obtained on any large extension of cultivation without the establishment of a Cold Storage Ware-house in Bangalore. It is probably premature to go into this question in detail, but I think some arrangements should be made to get a number of apprentices trained under Mr. Mc Isaac. There is a great complaint of lack of opportunities by the middle classes to obtain employment of a remunerative character. Here at any rate appears to be an opening for young men and possibly for retired officials who can command the necessary capital. Such young men must be imbibed with the desire to cultivate the land and willing to undergo the privations necessary to make successful fruit growers, *i.e.*, they cannot live in Bangalore and make occasional trips to their farm, but they must live on the spot and supervise the work continuously. The ordinary graduate seems to prefer a sedentary life but there should be very large number of young men who have a natural liking for such a work and if assistance was given to them to get suitable training, it might lead to a very large development of Fruit Gardens in the State. It is hardly possible for me to exaggerate the prospects of development in this direction and I will only allude to what is going on in California, Florida, Ontario and certain other parts of Australia. Fruit is abnormally dear in India and the usual arrangements for marketing it are singularly deficient. Mr. Mc Isaac told me that he sells his crop of Apples at an average of a Rupee per dozen, but the ultimate customer pays for them Rs. 4 a dozen and for selected specimens, as high as Rs. 6 a dozen. I am of opinion that the possibilities of this industry should be carefully examined and proposals formulated for its development. I have no practical experience of fruit growing in India, but it does appear to me that the problem of growing good fruit has been solved in a most remarkable manner and, as Mr. Mc Isaac is anxious to see other people following his example, it would certainly be wise to ascertain in what manner his experience can be utilised to encourage others to take to the same kind of work.

I might also point out that a profitable subsidiary outcome of the development of Citrus cultivation would be the preparation of Candied peel and the preservation of small fruits in sugar.

Minerals.

The development of the mineral resources of the State for many years past has been steadily pursued by Government through the agency of the Department of Mines and Geology, which has issued a valuable monograph on the Mineral Resources of Mysore. The phenomenal success of the Kolar Gold Field led to extensive and expensive prospecting for gold in all parts of the State but unfortunately without any success. Gold was found in many places but never in remunerative lodes and for some years past, prospecting for this Mineral has been abandoned. I have consulted Mr. P. Sampat Iyengar to ascertain if in his opinion it would be worth while for Government to re-examine any of the abandoned workings and he tells me that he knows of no place which he could recommend to Government as offering sufficient inducements to warrant a considerable outlay on further exploratory work. He admits there may be other lodes of equal richness to the Champion Lode of the Kolar Field but no one has been able to discover them and there are no indications that in the slightest degree would assist in the search for them. I had in my mind the possibility that it might have been a practical proposition for the State to form a well equipped prospecting section of the Department of Mines and Geology and to spend, say, a lakh a year in the systematic search for Gold reefs, but in the face of Mr. Sampat Iyengar's opinion, I am reluctantly compelled to abandon the idea. This means that it is very unlikely any further gold prospecting work will be done and except for accidental discoveries, Mysore will, in the future, produce no gold other than that yielded by the Kolar Mines.

As regards other Minerals, Mr. Sampat Iyengar agrees with me that a moderate amount might at any rate for some years to come be spent judiciously in mineral exploration. In support of this, he points to the fact that with a grant of about Rs. 5,000 Ingladhal Copper Mine has been opened out to a sufficient extent to make it almost certain that a working proposition is in sight and that in the Gonur Hill a vein of silver bearing antimonial lead has been discovered that justifies a considerable amount of further exploratory work. Discussing the present position, I elicited from him that he thought that if his Department were strengthened by the addition of a Mining Engineer on Rs. 500 a month and two Assistants on Rs. 200 a month, with an annual grant of Rs. 25,000 for field work, he would at any rate be able to make a fairly thorough examination of the mineralised areas near Chitaldrug. In view of the fact that there is work in sight at Ingladhal and Gonur Hill which justifies further expenditure, I certainly suggest that something should be done on the lines indicated by Mr. Sampat Iyengar. It is open to Government to enlist private enterprise to work its mines or as an alternative, State mining may be undertaken including the reduction of the ores. It is, however, premature to discuss which method of final development should be adopted as obviously it will be wise for Government to continue the preliminary exploration till it has accumulated sufficient data to determine approximately the extent and value of the mineral deposit. With such information, it can make a better bargain with a mining company in regard to the distribution of profits or it can decide without incurring undue risk to carry on the venture and secure the whole of the profit. I by no means advocate that this latter course should be pursued but I think the way to it should not be barred till much more is known about the potentialities of the mine. It would seem that this information can be cheaply obtained and if it proves of a favourable character the value of the mining lease or concession will be greatly enhanced.

I understand that the discoveries at Gonur Hill are merely of a promising character and that the vein of galena ore which has been opened up must be regarded as an indication of an ore body the existence of which has not yet been determined. As the preliminary work progresses, the situation can be reviewed from time to time and suitable measures resolved upon.

The existence of prospecting operations on a considerable scale will greatly facilitate a very close examination of the country all round them for further indications of mineral wealth.

State aid to Industries.

This note will not deal with either industrial banking or the current finance of trade and industry. The Government of India propose to appoint a Central Committee and Provincial Committees to inquire into these matters, to collect information regarding the disabilities under which the normal commercial life of the country is suffering from the inefficiency of the methods of mobilizing capital and to suggest means whereby the owners of infructuous hoards may be induced to place them at the disposal of the community for the advancement of the general welfare and the enhancement of their private incomes. We may well wait for the considered conclusions of these expert committees.

The Government of Mysore has recently received an elaborate report on "State Aid to Industries" which was discussed at the recent Economic Conference and subjected to severe criticism. It is a matter of regret that it should have been of such an impracticable character that it affords no help to those charged with the Administration of public funds regarding

either the necessity for granting State aid, or the form which it should take. It is very much a local problem presenting different aspects in the various Provinces and States of India. Here in Mysore, we have a compact State, under its own Ruler, with a people strongly imbued with local patriotism and anxious to be, as far as its own internal resources permit, independent of the rest of India. The revenues of the State come from the people and it is right and proper that they should be used to forward their legitimate aspirations. There is a vast gap between the concentrated resources of the State and the very feeble scattered resources of the people. Tentative efforts at combination in the form of joint stock enterprise are only just beginning and have so far met with but little success. Individual efforts have fared better and there is steadily growing up a fairly advanced type of modern industry on a small scale fostered and encouraged by the facility with which electric energy can be obtained. It is certain that no more potent aid to industrial enterprise can be devised than has already been furnished by the investment of public money in the distribution of energy derived from the hydro-electric station at Sivasamudram. It is possibly capable of further expansion in rural areas and by taccavi loans and by the sale of machinery on the hire purchase system, there is very clearly marked field in which State funds may be temporarily locked up. For about 15 years, the Director of Industries has been empowered to grant State aid in this way and the last published summary of the results reveals a fair amount of success. The time seems to be ripe for a careful examination of the procedure with a view to eliminating weak applicants who become defaulting clients. This can only be done by more careful preliminary investigations and by a more rigid enforcement of the rules under which contracts are made. Experience should have accumulated in regard to the importance of ascertaining the character of applicants for assistance, in regard to the probability of a successful utilisation of their resources. Some of the failures are undoubtedly due to the adoption of somewhat sanguine estimates of the business capacity of applicants and in some, but possibly fewer cases, to inappropriate advice tendered by not too capable officers of the Department. Limitations have never been clearly laid down as to the nature of the enterprise that may be assisted in this way. The general criterion of suitability should be that the enterprise should be of a non-speculative character and that it should contribute to the development of the resources at the disposal of the applicant for assistance. A raiyat may obtain a plough if he has land to cultivate, or the owner of a well an engine and pump if the water supply is good and can be utilised; but I would not grant a taccavi loan to set up a rice mill or sell on the hire purchase system the machinery for a printing press to the publisher of a prospective Newspaper. On the other hand, if a man had established industrial works of any kind and could improve their output by the installation of additional machinery, I consider he might be helped to obtain it on the hire purchase system. In the past, there has, I think, been too much leniency in dealing with defaulters and it is necessary to strictly enforce the repayments when they become due. Generally Government is not regarded as an easy-going creditor but in this special direction public sympathy is apt to be on the side of the defaulter and Government "Aids" to industry are looked upon as "Easy money." The tale of defaulters disclosed by Mr. A. G. Clow in his recent book on "The State and Industry" is a deplorable record of incompetence and irresponsible administration in almost every Province in India.

In my note on "Sugarcane cultivation under the Krishnarajasagara" I have indicated very clearly that I am in favour of Government rendering very substantial assistance to the cultivator to enable him to adopt that type of cultivation which will yield the highest return from the land. In this instance, the case for financial assistance is enormously strengthened by the very large investment which has already been made in the irrigation works which will bring the water to the raiyats' fields. Here we have on one side a comparatively wealthy and highly organised Government bringing to bear on the development of the material resources of the State, engineering talent of the highest order combined with abundant capital to render the project a complete success from the technical side. But on the other hand, there is an ignorant and poverty stricken raiyatwari upon whom will be thrust the responsibility of making profitable use of the water. To leave them unaided implies a very imperfect conception of the practical problems confronting the cultivator. The comparative failure of Marikanave should not be without warning as to what might happen again. All over India it would not be difficult to show that the *Laissez Faire* attitude of Government in dealing with cultivators under irrigation works constructed at great expense has resulted in extremely jejune results. The time has passed when we can thus deal with great and beneficent works. Whether the poverty of the people is increasing, or the reverse, I cannot definitely say but we know that year by year their numbers are increasing and, with equal certainty, that the expenses of administering the country are growing at a rate which a few years ago would have excited the most gloomy forebodings. To-day the people have some voice in the management of public affairs and if they are to show themselves worthy of such political advancement they must be prepared to recognise that the responsibility rests with them to see that the utmost utility is derived from expenditure on new public works. Hitherto the position taken up by the Government of India in respect to the management of irrigated cultivation is

analogous to that of a company which having established an up-to-date factory leaves it to be run by the work-people without any financial assistance or technical guidance. The analogy may not be quite perfect but it serves to draw attention to the illogical attitude which has prevailed in the past. When fully developed, the provision of current finance for the Krishnarajasagara will amount to nearly a crore of rupees and capital expenditure on plant may well absorb another crore. It behoves us, therefore, to go carefully and while there is time, to make small experiments which will yield valuable information and experience for future guidance. In this matter, I have already drawn attention to the results obtained by Mr. B. K. Garudachar at Kyatanhalli and I suggest that during the next cold season, arrangements should be made with at least three suitable groups of raiyats to carry out similar schemes of intensive cultivation.

In all developments of this nature, we must go slowly and systematically accumulating experience, creating a favourable public opinion and above all training an adequate staff to supervise operations.

For half a century or longer, the ignorance of the raiyat and his lack of resources has been recognised as at the bottom the cause of all the poverty of India and the co-operative credit movement has been hailed as the panacea for the ills the country suffers from. It has been tried for a quarter of a century but no candid observer can trace any material change in the condition of the rural population that can be attributed solely to its influence. I do not assert that it has been a complete failure but the results have not justified the expectations which heralded the initiation of co-operation, and perforce we must look to other ways by which we can solve the problem. The raiyat has small means and no credit—the State has both. It is, I am confident, not beyond our administrative capacity to devise methods by which the cultivator can be directly assisted. In Mysore, I would begin with the sugarcane cultivation and extend assistance later to the cultivation of other crops and possibly, eventually even to dry crops. For a period which may be long or short, the cultivator will no doubt be subject to control but that will do him good and when he begins to prosper, his outlook will broaden and he will be able to dispense with extraneous support.

The complaint is raised that our system of University Education turns out graduates of no use to the country and little use to themselves. No doubt it is partly true. But why turn out such people? The land must always be looked to as the main support of the people of India and one material object of education should be to get more out of the land. Agricultural Colleges and Schools should be full of pupils studying everything that pertains to rural economy with a view to ultimately taking part in the general supervision of financed cultivation.

It does not seem to me to be good policy to attempt to the probable ultimate consequences of a wisely evolved system by which the State provided "Current finance" for agriculture. It would be easy to stigmatise it as utopian and to say that it was nothing but a dream which took no cognisance of the frailty of human nature. For the present, then, I confine my suggestions as to the granting of State Aid in this particular form to those already referred to in my Note on the cultivation of sugar. Experience gained there will doubtless justify further advances and indicate the best way to make them. I now come to the discussion of the question as to the measures which the Mysore Government may take to aid private enterprise in industrial undertakings and the extent to which it may play the part of an Industrial Bank and lock up comparatively large amounts of money in manufacturing concerns over the operations of which they will be able to exercise but a limited degree of control. It may be conceded that the private individual finds great difficulty in raising money for industrial ventures and rightly so, because in the vast majority of cases, he is totally unable to show that his career justifies him in asking to be entrusted with other peoples' money. Rashly he may invest his own money in some undertaking and start work with perhaps an ill-equipped plant and almost certainly with insufficient working capital and no credit. When he gets into difficulties as inevitably he does, the Banks refuse to help him, his friends don't trust him and to avoid his importunities, they suggest he should appeal to Government to tide him over an awkward corner. In this way has grown up the idea that the Banks are hard-hearted usurers, not alive to the needs of the industrialist and only anxious to levy toll on the trade and commerce of the country. Only therefore in very exceptional cases, can it be prudent on the part of Government to undertake financial risks which experienced business men decline. It is true that the Banks have not on their staffs technical experts capable of taking long views of the prospects of new industrial ventures, but equally Government is only rarely equipped with officers qualified to advise them in such matters and the relegation of applications for assistance to hybrid committees of Government officials and business men has proved everywhere to be a failure and to have involved the Provincial Governments of British India in heavy losses. There are on record instances where loans thus advanced have been repaid and industrialists helped out of temporary difficulties with advantage all round, but they are very few and by no means counterbalance the defaulting concerns.

Minerals.

The development of the mineral resources of the State for many years past has been steadily pursued by Government through the agency of the Department of Mines and Geology, which has issued a valuable monograph on the Mineral Resources of Mysore. The phenomenal success of the Kolar Gold Field led to extensive and expensive prospecting for gold in all parts of the State but unfortunately without any success. Gold was found in many places but never in remunerative lodes and for some years past, prospecting for this Mineral has been abandoned. I have consulted Mr. P. Sampat Iyengar to ascertain if in his opinion it would be worth while for Government to re-examine any of the abandoned workings and he tells me that he knows of no place which he could recommend to Government as offering sufficient inducements to warrant a considerable outlay on further exploratory work. He admits there may be other lodes of equal richness to the Champion Lode of the Kolar Field but no one has been able to discover them and there are no indications that in the slightest degree would assist in the search for them. I had in my mind the possibility that it might have been a practical proposition for the State to form a well equipped prospecting section of the Department of Mines and Geology and to spend, say, a lakh a year in the systematic search for Gold reefs, but in the face of Mr. Sampat Iyengar's opinion, I am reluctantly compelled to abandon the idea. This means that it is very unlikely any further gold prospecting work will be done and except for accidental discoveries, Mysore will, in the future, produce no gold other than that yielded by the Kolar Mines.

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I understand that the discoveries at Gonur Hill are merely of a promising character and that the vein of galena ore which has been opened up must be regarded as an indication of an ore body the existence of which has not yet been determined. As the preliminary work progresses, the situation can be reviewed from time to time and suitable measures resolved upon.

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The Government of Mysore has recently received an elaborate report on "State Aid to Industries" which was discussed at the recent Economic Conference and subjected to severe criticism. It is a matter of regret that it should have been of such an impracticable character that it affords no help to those charged with the Administration of public funds regarding

Sisal Hemp.

I had intended to discuss the question of introducing Sisal Hemp cultivation into the State at some length but unfortunately, I have only received Dr. Coleman's report on the results of the experimental cultivation too late to do more than forward it to Government with a few brief remarks. The chief factor contributing to successful growth of Sisal Hemp is the presence of lime in the soil. Without lime, it is bound to be a failure. It would be well to have soil analysis made at all the experimental plots and endeavour to ascertain the minimum percentage of lime which must be present to secure good growth of leaves. The success at the Hirevatte Estate is more likely to be due to suitable lime conditions than to the heavy rainfall. A dry poor soil yields a leaf of high fibre content and what is equally important, a strong fibre. Rich soils and abundance of moisture promote the growth of a large leaf containing much pulp and weak fibre.

These experiments though not complete demonstrate that in two areas, the conditions are favourable for the growth of Sisal Hemp. It is an extremely easy crop to grow but one of no commercial value unless the area under cultivation is large enough to keep a single unit of decorticating plant at work throughout the year. Only machines of large capacity seem to be capable of doing good work and writing without being able to make enquires about the capacity of machines now on the market, I think it would be little use setting up a fibre factory for a smaller area than 1,000 acres. This should turn out 300 tons of fibre per annum as an absolute minimum and the crop would be worth at present prices about £12,000 on the London market. That is to say, the gross value of the produce would be Rs. 160 per acre. Carting the leaves to the factory, cleaning the fibre, baling it and transport charges would be heavy but the bulk of the expenditure would be local. I suggest no figure for the actual profit, but I think it will be an attractive one. The main advantage is that a crop can be grown in the dry areas of Chitaldrug which will yield about Rs. 100 per acre for the payment of local labour—allowing Rs. 60 for transport and profit. It needs no elaborate argument to obtain acceptance of the proposition that if this be really true, it will be almost criminal to neglect to secure for the people of these poverty-stricken areas an opportunity to improve their position. I, therefore, commend Dr. Coleman's valuable note to the serious consideration of the Development Department and I suggest that steps should be taken to extend the plantations at the Babbur Farm and at Hirevatte, with a view to providing nurseries for the extension of the cultivation to thousands of acres.

For this to come about the raiyats will necessarily require assistance. The Agricultural Department have ample data to furnish an estimate of the cost of starting plantations. Presumably most of the land to be taken up will be waste land and it appears to me to offer an excellent opportunity to make some attempt to establish village communal cultivation under the control of Village Panchayets. If a cluster of 10 villages with suitable soil each took up about 100 acres, it would be possible to set up a fibre factory in the centre of the area and give much needed and remunerative subsidiary occupation to a large number of cultivators. This would be particularly valuable in years of drought when the crops might fail but when the sisal hemp plants would be totally unaffected. I regret that this important matter should have been left to the last and I can only hope that the experiments will be continued and the collection of essential data completed, so that it will be possible to turn these promising results to some useful development without loss of time.

WD 3084—GPB—150—11-6-29.

Mr. U.S. MALLAPPA.-- Will you kindly let me know whether he changed his opinion

Mr. PRESIDENT.-- I do not know what opinion you refer to.

The cut motion was thereupon withdrawn by the mover with the permission of the House.

x x x

H.C. 94-29-1

12

D.O.No. 1102-15/Fac

Dear Sir,

I am desired to forward herewith a ~~copy~~ printed copy of Sir Alfred Chatterton's Notes and to request that it may be kindly treated "Confidential."

The favour of an acknowledgment is also requested.

Yours sincerely,

Secretary to Government.

To

The Director of I.&C.
The Deputy Commissioners of Dts.
The Secretary, E.C.
The Registrar, Mys. University.
The Secretary, Bd. of Mgt. M.I.W.
The Director of Geology.
Sir. K. P. Puttanna Chetti.

G.R.S. III—31

THE MYSORE IRON WORKS
BHADRAVATI

No. B. 98/29

2nd August 1929.

Mysore Geological Department.

Bangalore, 2nd Aug 1929

No. 4027-1.

Dear Sir,

I beg to acknowledge, with thanks, the receipt of a copy of Sir Alfred Chatterton's Notes, forwarded with your D.O.No.D.1102-15, dated 31st July 1929.

The Note will be treated as "Confidential".

Yours sincerely,

E.V. Ganapathi Iyer, Esquire, B.Sc.,
Assistant Secretary to Government,
Development Departments.

C.N.

G.R.S. III—3]

Routine Notes.

[To be used only for notes, requisitions, etc., not intended for permanent record.]

N.B.—Should routine notes be written on small slips, the notes must be copied, or slips pasted on this form.

15

G.R.S. III—31

THE MYSORE IRON WORKS
BHADRAVATI

14

No. B. 98/29

2nd August 1929.

DEVELOPMENT BRANCH

Dear Sir,

I write to acknowledge with thanks the receipt of the 2 printed copies of Sir Alfred Chatterton's Notes, forwarded with your letter No.D.1102-5 dated 31st July 1929.

I also note that the same should be treated as "Confidential".

Yours sincerely,

M. Viraraja Urs

E.V. Ganapathi Iyer, Esq., B.Sc.,
Assistant Secretary to Government,
Bangalore.

D.O. No. L.Dis. 311
29-30

OFFICE OF THE DEPUTY COMMISSIONER,
KADUR DISTRICT.

17

1189

Chikmagalur, dated 3rd August 1929.

Dear Sir,

I write to acknowledge receipt of the copy of Sir Alfred Chatterton's Notes sent under cover of your D.O.letter No.D.1102-15 dated 31st July 1929.

Yours Sincerely,

H C Ramaswami

16

Do No. 11-29

Office of the Deputy Commissioner,
Mysore District,

Dated Mysore, 3rd August 1929.

1175

Dear Sir,

I am desired to acknowledge with thanks the receipt of a copy of Sir Alfred Chatterton's Notes sent with your D.O. No. 1102-15 dated 31st July 1929.

Aug 5/1929

Yours sincerely,

A Ramachariyar

E.V. Ganapathi Iyer, Esq., B.A.,

Assistant Secretary to the Government
of Mysore,
General & Revenue Secretariat,
Bangalore.

Serial No.

Bangalore
5 August 1929

No. 1242

Dear Sir,

I have much pleasure in acknowledging receipt of a printed copy of Sir Alfred Chatterton's note, & thank you for the same.

Yours sincerely
K Ramiah

K Ramiah Esq
Development Secretary

GEN. & REVENUE DEPARTMENT
DEVELOPMENT BRANCH.

Note—Contn. Sheet

WD 01684—GPB—30,000—20-4-29

HC 94-29-2

GENERAL & REVENUE SECRETARIAT,

Bangalore dated 6th August 1929.

D.O.No. D 1382-90 Sec a Cy yrs.

Dear Sir,

I am desired to forward herewith a printed ~~C.M.~~....of Sir Alfred Chatterton's Notes and to request that it may be kindly treated as "Confidential".

690

GENERAL & REVENUE SECRETARIAT,

Bangalore dated 6th August 1929.

D.O.No. D 1382-90 / Sec a Cy of Note by Sir A. Chatterton

Dear Sir,

I am desired to forward herewith a printed ~~C.M.~~....of Sir Alfred Chatterton's Notes and to request that it may be kindly treated as "Confidential".

GENL. & REV. SECT. 8 AUG. 1929 FINANCIAL BRANCH.

The favour of an acknowledgment is also requested.

Yours sincerely,

Received with thanks 7/8/29

GENL. & REV. DEPARTMENT 1284 7 AUG 1929 DEVELOPMENT BRANCH

B. Sivaramayya Offg. B.A.B.L.
Financial Secretary to Govt.
Dev. Dept.

92

D.O. No. G.

GENERAL AND REVENUE SECRETARIAT,

Dated, Bangalore, 7th August 1929.

266

GEN. & REV. SECRETARIAT
1266
8 AUG. 1929
DEVELOPMENT BRANCH.

Dear Sir,

I am desired to acknowledge with thanks, the receipt of a copy of Sir Alfred Chatterton's Notes forwarded with your D.O. letter No.D.1382-90/I & C., dated the 6th August 1929.

Yours sincerely,

1829

Tel: Address:—"ELECSEC."

D. O. No. 29/1682

KRISHNARAJASAGARA SECRETARIAT,

Dated, Bangalore, 7th August 1929.

GOVERNMENT OF MYSORE

8829

GEN. & REV. SECRETARIAT
1337
9 AUG. 1929
DEVELOPMENT BRANCH.

Dear Sir,

I write to state that I am in receipt of the printed copy of Sir Alfred Chatterton's Notes (marked Confidential).

Yours sincerely,

To

N. Rama Rao, Esq., B.A., B.L.,
Secretary to Government, Development
Departments, Bangalore.

GOVERNMENT OF MYSORE

ADDRESS FOR TELEGRAMS:
SANDAL
BANGALORE

SANDALWOOD OIL FACTORY
SANKEY'S LODGE

Bangalore, 8th August. 19 29

FC. 2920.
Dev: Br:

OFFICE OF THE DEPUTY COMMISSIONER,
HASSAN DISTRICT,

Dated Hassan, the 6th August 1929.

From

S. ABDUL WAJID. Esq., B.A.,
Deputy Commissioner, Hassan District.

eceipt of
so a copy
n.

To

B. Narayanaswami Iyengar, Esq., B.A., B.L.,
General Secretary to Government,
Bangalore.

Sir,

erely,

I have the honour to acknowledge receipt of a printed copy of Sir Alfred Chatterton's Notes kindly sent with your D.O.No.D.1102-15 dated 31-7-1929.

I have the honour to be,
Sir,
Your most obedient servant,

For Deputy Commissioner,
Hassan District.
(Absent from Head quarters)

I.S.D.

NIVERSITY OF MYSORE.

No. 4027
Enc. —

Office of the Mysore University,

Dated Mysore, 9th August 1929.

From

B. M. SRIKANTIA, Esq., M.A., B.L.,
Registrar, Mysore University,
Mysore.

To

GENERAL AND REVENUE SECRETARIAT,

Dated, Bangalore, 9th August 1929.

D.O. No.

Dear Sir,

I write to acknowledge the receipt of a printed copy of Sir Alfred Chatterton's Notes which you kindly forwarded with your D.O.No.D. 1382-90/I & C. dated the 6th instant.

Yours sincerely,

R. Rao

E. V. Ganapathi Iyer, Esq., B.Sc.,
Assistant Secretary to Govt.
(I. & C. Deptt.)